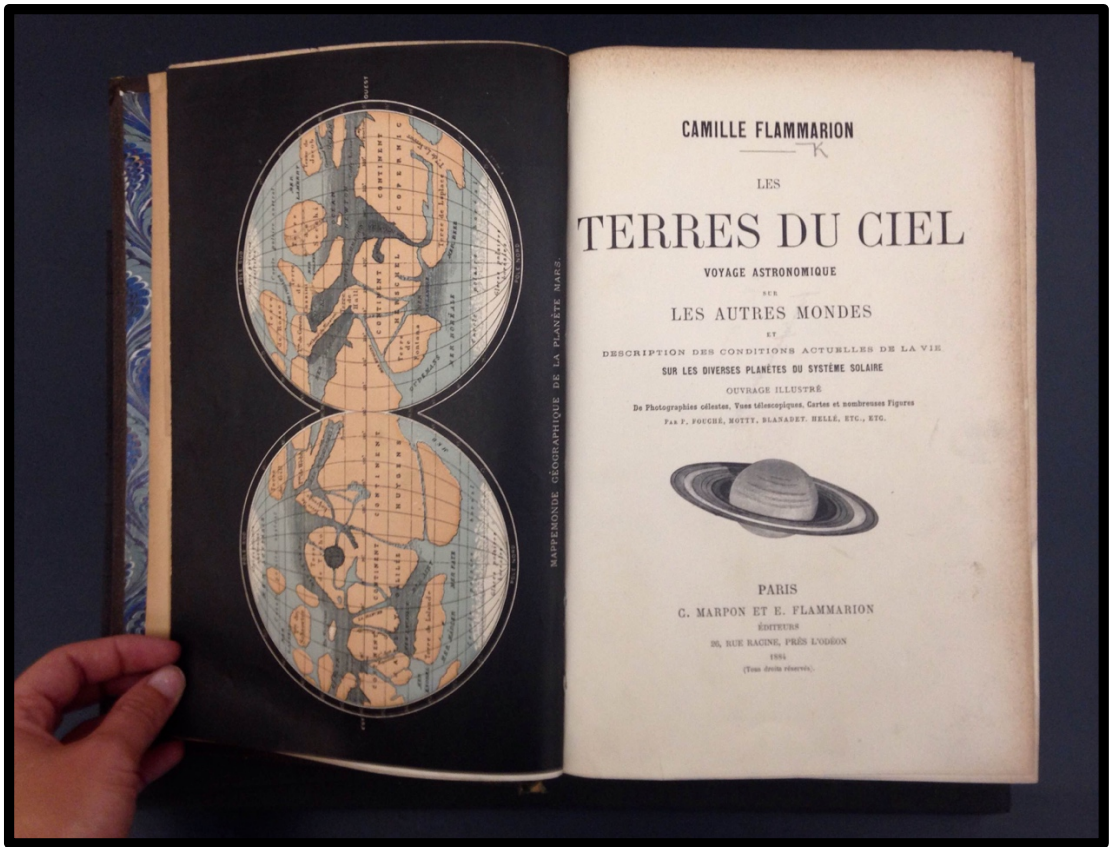
CAMILLE FLAMMARION'S MARTIAN VOYAGE

It's hard to look down when you look up



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ABSTRACT

Profiting from Camille Flammarion's *Les Terres du Ciel* (edition of 1884) subtitle headline – *Voyage Astronomique –,* I intend to develop my analysis on the book's first *Livre* and 'Land of the Sky' to be visited by the Astronomer's words: Mars. Camille Flammarion's *Martian Voyage* is structured in three parallel, yet crossing, '*voyages*': *Voyage Astronomique, Voyage Pittoresque* and *Voyage Mélancolique*.

The first two journeys are driven by the two main illustrations in constant exchange throughout the book, named by the French Astronomer as the '*vue télescopique'* and the '*photographie céleste*'. Both concepts offer the same point of interception: in the late nineteenth century, after the Moon's first photographic appearance in 1840, the Martian Observations aimed for the camera 'objectivity' to settle the current scientific controversial thesis, as is the case of the Italian astronomer Giovanni Schiapparelli (1835-1910)'s *Artificial Mars Canals Theory*.

Given the impossibility in *Les Terres du Ciel'*s time to show such Martian photographs, the photographic will be used in a symbolical form within the pages of Camille Flammarion's manual to look. I intend to explore how the mapping production around the Martian observations reinvents itself after the appearance of Photography and, at the same time, aims not to diminish its authorial scientific 'mapping hand': the narrator's hand.

Finally, in the *Les Terres du Ciel'*s third *voyage,* and I hope my dissertation will contribute to this view, the Planet Mars stands as a liminal place framing a liminal time. By never achieving the desired Martian altitude, Camille Flammarion's *Martian Voyage* offers a relevant guide to the late nineteenth's century history of Astronomy and its mapping production: flying in between academism and amateurism, in between the scientific and the aesthetic, in between the responsibility for 'objectivism' and its implicit 'subjectivism'.

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INTRODUCTION

In the same year that Camille Flammarion's *Les Terres du Ciel* was published (edition of 1884[1]), *Le Livre-Revue Mensuelle* wrote:

> *"Dans ce nouvel ouvrage de vulgarisation scientifique, l'auteur de 'Étoiles' entreprend un voyage astronomique sur les autres mondes et donne la description des conditions actuelles de la vie sur les diverses planètes du système solaire. Après lecture de ce for volume, qui ne comprend pas moins de 775 pages, notre voisine la planète Mars, notre jeune sœur la planète Venus, Mercure, la lune et le monde géant de Jupiter, Uranus ainsi que Saturne n'ont plus le moindre secret pour nous; c'est la vie dans l'infinie. Cet ouvrage intéressant foisonne d'illustrations de toute nature. Ce livre représente plus que de la science mise à la portée de tous; il représente encore la librairie à bon marché."*[2]

The review already introduces what Camille Flammarion (1842-1925) pragmatically omitted in his *Les Terres du Ciel*'s cover [**fig. 1**]: its extensive subtitle. Only after opening the book and arriving to its descriptive page, can the reader clinch what was initially left out: "*Voyage Astronomique sur les Autres Mondes et Description des Conditions Actuelles de la Vie sur les Diverses Planètes du Système Solaire"*. Now completed, the "book to come"[3] is fully announced: the reading will become a *voyage astronomique* visiting the 'Lands of the Sky':

[1]An earlier edition of *Les Terres du Ciel* was published in 1877 – Flammarion, Camille, *Les Terres du ciel, description astronomique, physique, climatologique, géographique des planètes qui gravitent avec la terre autour du soleil et de l'état probable de la vie à leur surface*, Paris: Didier, 1877 –, however, the new edition, even if profiting from some former textual and visual data, presents a different argument.

[2]Uzanne, Octave, "Critique Littéraire du Mois, Dernier Coup d'œil sur les livres d'étrennes pour 1884", in *Le Livre : revue mensuelle*, Paris: A. Quantin, 1884, p. 22

[3]Derrida, Jacques, *Paper Machine*, Stanford: Stanford University Press, 2005, p.15

Mars, Venus, Mercury, Earth, Moon, "*Les Petites Planètes"* ('The Small Planets'), Jupiter, Saturn, Uranus, Neptune and the Infinity…[4]

However, between the cover and that descriptive page, the reader gazes at something different: the book's frontispiece, the *Mappemonde Géographique de la Planète Mars* [**fig. 2**]. In the book form, that illustrative page plays with the visual what the title played with the textual. In *Les Terres du* Ciel, the frontispiece becomes the book's second façade, its interior's exterior face also announcing the *voyage* to come and, more crucially, its leading destination – the Planet Mars, the book's "*Livre Premier*, *Notre Voisine la Planète Mars"* –, also the leading destination of my analysis here[5].

Nonetheless, the *thelos* concluding this book will not achieve a specific '*terre'* nor '*monde'*, but – and profiting here from the French terminology – the book's aspiration '*de se mondialiser'*, its aspiration to be 'popular', or, in other words: it is about '*la science mise à la portée de tous', 'à bon marché'*. In order to do so, Camille Flammarion should go beyond the mere view of planets and the presentation of their location.

In 1880, following the didactics approach of François Arago's *Astronomie Populaire* lessons and posthumous publication (1854-1857), Flammarion published his own version of Arago's publication and wrote:

> *"However, in spite of this splendid progress, it would have seemed to me rash to publish a new «Astronomie populaire» ; after the important work of Arago, if twenty years of astronomical labours and of free discussion had not directly prepared the way, and if*

[4]Flammarion, Camille, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire*, Paris: C. Marpon et E. Flammarion, 1884

[5]Since *Les Terres du Ciel* (1884) will be used as the object of analysis here, Camille Flammarion's words will be left in their original form and this goes for all his quotes used in this body of work. Other publications translated to English will be used here in their English format for they were written with the consent of the author.

> *more than two hundred thousand classes of society, and thus given the opportunity for a publication destined to diffuse under a more general form a taste for this magnificent science; (...).*"[6]

Moreover, inasmuch Astronomy should be informative, evoking the educational message of the French Third Republic, it should also fight the exhausting mathematical procedures of the Academy at the time:

> "*(...)l'Astronomie mathématique dominait et éclipsait si complétement l'Astronomie physique, que celle-ci semblait végéter comme la violette à l'ombre au pied du grand chêne; le ciel n'était qu'une page de chiffres, et les aspirations de l'âme humaine vers les mondes célestes, qui commençaient à se révéler, étaient taxées des rêveries et d'inutilités*."[7]

As such, *Les Terres du Ciel*'s Astronomy will drive along with that sense of a non-professional profession made for all *les astronomes amateurs*: teaching how to look.

Firstly, the extensive title and the detailed frontispiece already claim that aim: the reading will escort the reader to a journey where the textual and the visual power of enunciation takes the form of settlement. Secondly, to the reader looking attentively at the *Mappemonde* – in the middle of all those geometrical and inscriptive lines – the two hemispheres shape something different: *les lunettes*. Then, in the subsequent descriptive page, the lens' presence is finally confirmed:

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[6]Flammarion, Camille, trans. Gore, J. Ellard ["with the author's sanction"], *Popular Astronomy: A General Description of the Heavens,* London: Chatto & Windus, Picadilly, 1894, pp. 2-3

[7]Flammarion, Camille (1884), p. 7

"*OUVRAGE ILLUSTRÉ*

De Photographies célestes, Vues télescopiques, Cartes et nombreuses figures"[8]

This striking announcement – similar to what the press was displaying at the time [**fig. 3**] – not only introduces a labyrinthic reading of numerous visual shapes, but also *Les Terres du Ciel*'s real novelty in the stream of Camille Flammarion's writing production and after his publication of 1877: Mars should be visited by the photographic camera. Following other astronomers' publications, such as those of Richard Proctor and of James Nasmyth, the first category of illustrations – the celestial photograph – will be *Les Terres du Ciel*'s main driver: in this *voyage*, gazing will be the only way to hit the road.

Finally, as the title of this dissertation – appropriated from Michel de Certeau's influential chapter "Walking in the City" – suggests, my aim is to deconstruct a visionary journey where Camille Flammarion's authority and the reception's 'visibility' will be its imminent arrivals. Firstly, de Certeau's analysis on the everyday is useful for this argument. In this 'picturesque' journey, the act of travelling – like walking – becomes secondary for the French Astronomer and becomes superimposed by his godlike figure of a 'view-pointer', a 'view-enunciator':

> "*His elevation transfigures him into a voyeur. It puts him at a distance. It transforms the bewitching world by which one was 'possessed' into a text that lies before one's eyes. It allows one to read it, to be a solar Eye, looking down like a god. The exaltation of a scopic and gnostic drive: the fiction of knowledge is related to this lust to be a viewpoint and nothing more.*"[9]

[8]Flammarion, Camille (1884), p. x

[9]De Certeau, Michel, "Walking in the City", in *The Practice of Everyday Life*, Berkeley, Los Angeles, London: University of California Press, 1984, p. 92

The Martian Atlas – placed in the book's departure – already claims the French Astronomer's voyeuristic authority. It means a transposition of Camille Flammarion's Martian Globe [**fig. 4**] – produced that same year – to the page's two-dimensionality. In the Map, the Planet Mars is already turned into a '*monde',* into an earthly-like *monde*. The abstractness of lines and coordinates meets the familiarity of an Earthly-analogy: continents and oceans, lands and seas, islands and ice lands. One doesn't quite notice that *pôle nort* (north pole) and *pôle sud* (south pole) appeared inverted – a consequence of the reflexive telescopic lens used to observe the Martian Planet.

The Map already introduces what the Astronomer will use as the headline of his first chapter: "*voyage interplanétaire - du globe terrestre au globe de Mars*". Camille Flammarion's interplanetary *voyage* will never abandon that intersection between two points: when to observe the Martian surface is only possible under excellent conditions, both the red planet's stillness and the Earth's clarity of atmosphere[10]. Like the French Astronomer will further resolve in his Martian *Livre*'s introduction*, Les Terres du Ciel*'s interior façade already confirms Mars as the most visible *terre* from the Earth:

> "*Notre voyage sera plus pittoresque. Nous commencerons, tout naturellement, par la terre céleste que sa proximité et sa situation favorable pour nos observations nous ont fait le mieux connaître, par notre voisine la planète Mars…*"[11]

On the same token, that 'interplanetarity' will also address a disconnection: Mars is never seen in its entirety, which forced the astronomers at the time to combine the direct optical examination with a more intuitive visual analogy. In the first steps to Mars, Camille

[10]Lane, K. Maria D., *Geographies of Mars - Seeing and Knowing the Red Planet*, Chicago, London: The University of Chicago Press, 2011, p. 48

[11]Flammarion, Camille (1884), p.16

Flammarion will try to overcome that dual ambiguity in between the authority of an earthly-ground mapping knowledge and the invisibility of the 'other'.

For the Astronomer, the solution is in "*La synthèse astronomique embrasse tout*!"[12] As the Atlas neatly shows, all those earthly geographies are named after different astronomical figures. This is also Camille Flammarion's Martian Map version after Richard Proctor's (1837-1888). Not only to define the unknown objectively, but also to claim Flammarion's Map as objective, the French version purposed to alter Proctor's scheme, which favoured the Englishmen, by adding more continental astronomers' names: a synthesis of past and present contributors to the Martian observations[13].

Together in the Map and in *Les Terres du Ciel*, Galileo, Huygens, Hershel, Schiaparelli, among others, will meet both by analogy and to support analogy: their data's similarity and their representations' similarity will be key to contest any form of scepticism. Cartography as a tool of choice will not only select the best Martian view, but also the best Martian viewer. Finally, to proclaim his Map as an established truth – as a tool of 'objectivity' over the implicit personal observation – the *voyage* to Mars will start by walking alongside with all those prior *voyages* to intersect the brighter 'other' in the Observatory field: *le Voyage Astronomique*, my first chapter.

Furthermore, in that '*pittoresque*' journey to the 'unknown', Camille Flammarion – the selective *voyeur* – is not alone. In the book's departure, his Map already assists the reader's gaze not to be misplaced (or 'misread') in the path for the skyline's viewpoint. Thus, the 'picturesque' – claimed just above by Flammarion himself – is also that degree in which the unvisited becomes visited only by the reader's expectative gaze: one already believes to be

[12]Idem, p. 6

[13]Lane, K. Maria D (2011), p. 28

visiting what the Martian Atlas shows as surface. Furthermore, *Les Terres du Ciel'*s '*mondialisation'* needs to be understood alongside the French Astronomer's personality of a *vulgarisateur.*

Camille Flammarion, who, in 1887, found the *Société Astronomique de France* and, after having creating the magazine *L'Astronomie*, wrote confidently about his attitude:

> "*Nous voulons populariser la science, c'est-à-dire la rendre accessible, sans ne la diminuer ni l'altérer, à toutes les intelligences qui en comprennent la valeur et veulent bien se donner la peine d'apporter quelque attention aux études sérieuses ; mais nous ne voulons pas la vulgariser, la faire descendre au niveau du vulgaire indiffèrent, léger ou railler. Il y a là une distinction qu'on ne fait pas assez. La science ne doit jamais être abaissée ou travestie ; il doit être présentée dans sa sublimité et en pleine lumière, et c'est à nous de faire l'effort convenable pour nous élever jusqu'à elle."*[14]

Meaning, Astronomy is a '*monde'* that all can reach, but whose uniqueness must still be preserved. In this '*mondialisation',* one of Camille Flammarion's prominent projects was the Celestial Globe [**fig. 5**] to the *Palace the Optics*, which he directed for the 1900 Paris World's Fair. Inspired by Étienne-Louis Boullée's Newton Cenotaph, the gigantic sphere – 145 feet in diameter – also promised a voyage to *Les Terres du Ciel*: in the interior, decorated with astronomical and mythological figures, the visitors would use the elevators and staircases to a second sphere, which, accompanied by music, was representing the planetary system[15].

The Celestial Globe is indisputably *Les Terres du Ciel's* tridimensional brotherly figure*:* as the Paris World's Fair's visitor, the reader will also gaze at a surface where mythological and

[14]Flammarion, Camille, "À nos lecteurs", in *L'astronomie*, No. 1, Paris: Gauthier-Villars, 1882, p. 3

[15]Nead, Lynda, "Lumen and the Celestial Archive of Images", in *The Haunted Gallery, Painting, Photography, Film c. 1900,* New Haven, London: Yale University Press, 2007, p. 224

astronomical illustrations meet in order to propose a *voyage* experience, but framed *in situ.* Like with the 'lensless' Map, in the book, if the 'machine' is absent, Flammarion solves the problem by appropriating current visual techniques through that visual and textual power of enunciation: a sort of 'technological *ekphrasis',* a sort of picturesque 'reality' effect. I also intend to explore how the book exactly plays the role of the reading body in a multi-faced 'mechanical' transportation drove by the '*vue télescopique'*, the '*photographie céleste*' and a third category – fabricated by me – the '*vue narcissique*'; shaping my three chapters: *Voyage Astronomique*, *Voyage Pittoresqu*e, *Voyage Mélancolique*.

Moreover, if the 'presentness' of *Les Terres du Ciel* is framed by the technical contingency of Cartography, the photographic lens here produces another ground of expectations: the wish that the technological progress will solve the Martian observation's challenges. *Les Terres du Ciel* becomes then an archive dependent of a future technical faith, a sort of work in progress, a permanent 'book to come'. The 'photographic' becomes here an expectation that produces in this archive that which Jacques Derrida further postulated in his *Archive Fever* (1995): its dependency of a future exteriority and its own 'sabotage' effect[16].

In 19th October 1889, writing for *Le Figaro* supplement*,* this expectation for the photographic is announced by Flammarion himself:

> "*Jamais encore, dans toute l'histoire de l'humanité, on n'a eu en mains la puissance de pénétrer aussi profondément dans les abîmes de l'Infini. Avec les perfectionnements nouveaux, la photographie prend nettement l'image de chaque astre, quelle que soit sa distance, et elle la fixe en un document que l'on peut ensuite étudier à loisir. Qui sait si quelque jour, dans les vues photographiques de Venus ou de Mars, une nouvelle*

[16]Derrida, Jacques, trans. Eric Prenowitz, "Archive Fever: A Freudian Impression", in *Diacritics,* Vol. 25, No. 2, Maryland: The Johns Hopkins University Press, Summer 1995, pp. 9-63

> *méthode d'analyse n'arrivera pas à découvrir les habitants ! Et sa puissance s'étend jusqu'à l'infini."*[17]

Nevertheless, by not being directly tangible by that desired camera, Camille Flammarion's *voyage* will solve its own 'sabotage' by reproducing that photographic medium as message and as symbol: the 'celestial photograph' explored throughout my second chapter, *le Voyage Pittoresque*. On one hand, that second category of illustration is what enables Flammarion to 'write' louder and broader. On the other and contrary to the 'view', the photographic also assures the data's preservation in the celestial time flux:

> *"Et il conserve sur sa plaque rétinienne tout ce qu'il a vu. Notre œil ne garde qu'un instant les images (...). Mais dans l'état normal des choses, nos yeux ne gardent pas les images…il y en aurait trop d'ailleurs. L'œil géant dont nous parlons conserve tout ce qu'il a vu. Il n'y a qu'à changer la rétine. Cet œil nouveau, c'est l'œil photographique."*[18]

Again – referring to the Martian Atlas –, those historical astronomical names designating the Martian geographies transform the metaphorical lens in a 'machine' of producing history. A third *voyage* is then to be written, my third chapter, *le Voyage Mélancolique* – when the photographic lens is turned into a phantasmagorical lantern enabling the spectral projection of lost light information, in need to be archived in the book, in need to be remembered.

> "*Il devait être réservé à l'Astronomie du XIXe siècle de donner un corps aux vagues aspirations des philosophes du passé (...). Oui! C'est à l'Astronomie de notre époque qu'il était réservé de couronner le lent et grandiose édifice des siècles, par cette*

[17]Flammarion, Camille, "Un œil nouveau", in *Le Figaro. Supplément littéraire du dimanche*, Paris: Le Figaro, Year no. 15, No. 42, 19/10/1889

[18]Ibid.

> *doctrine sublime de la Pluralité des Mondes, qui répand dans l'infini des splendeurs de la vie et de la pensée, et qui donne un but rationnel à l'existence de l'Univers."*[19]

Finally, the legacy of the past also needs to frame the nineteenth-century's 'presentness'. Like Mapping, History is also about production: a form of everyday practice, dependent on the apparatus in which the self is constructed. Here, the 'photographic lantern' is the trope that enables Camille Flammarion both to encounter and leave a legacy: the machine doesn't exclude the Astronomer's will, but works to preserve that 'lust to be a viewpoint'. Authority becomes the book's main driver.

Now given, *Les Terres du Ciel*'s unmasked *telos* is what finally resolves its 'sabotage':

> "*La thèse proposée dans 'La Pluralité des Mondes Habites' peut maintenant être grandement développée et aboutement confirmée. Tel est le but de ce livre-ci."*[20]

In that apparatus, the 'now' framing the lantern projection is also dependent of the 'otherness' gaze – 'The Plurality of Inhabited Worlds' – and a more evolved Martian 'other'. Here, like travelling, the desire to see Camille Flammarion's authorial actuality also precedes the means of satisfying it: when looking is about that remembering by synthesis, being looked back at will also be about wishing not to be forgotten. The book's end comes back to its origin and the Icarus' voyeurism is exposed to his vertiginous present of departure: *It's hard to look down when you look up.*

[19]Flammarion, Camille (1884), p. 3

[20]Flammarion, Camille (1884), p. 7

VOYAGE ASTRONOMIQUE: 'vue télescopique'

The first chapter of the '*Livre Premier' – Voyage interplanétaire - du globe terrestre au globe de Mars* – presents, as the first visual data, an almost page-sized illustration signed by both Paul Fouché and Kemplen [**fig. 6**]. Nevertheless, since its margins are slightly curved, contrary to the majority of the page-sized rectangular illustrations given in *Les Terres du Ciel,* I believe it to be of a different kind. Neither belonging to the '*vue télescopique'* nor to the '*photographie céleste'*, the reader encounters nothing more than an illustration – a simple '*figure'* among those '*nombreuses figures' –,* as Flammarion had already announced in the book's descriptive page.

However, this figure, contrary to the others '*nombreuses figures',* plays a different role. Like the *Mappemonde,* this simple figure also concludes this '*Livre'* within the *Livre.* If synthesis is the key to analyse the cosmos, synecdoche will be the key to understand this fragment: this part is standing for the whole. As I will argue, this almost meta-illustration has embedded in itself at once the '*vue télescopique',* the '*photographie céleste'* and the '*vue narcissique*'.

Captioned with "*...Examinant avec soin la planète rapprochée, l'astronome distingue et dessine les continents, les rivages, les îles de la géographie de Mars…",* the figure represents Camille Flammarion looking through the telescope, directly creating on paper by the hand what the eye sees [**fig. 7**]. The astronomer, '*en dessinant*', states his authority in front of the machine and within the book: he is producing his 'telescopic view*'.* Being the only one proceeding there, he conveys to the machine a secondary role: knowledge production becomes the eminent key.

The 'view' as an "image of objectivity" presents human agency as primordial: first, by the hand of the astronomer '*dessinateur'* and interpreter; second, by the hand of both engravers mediating and signing it to the page[21]. Nonetheless, that 'view' primarily belongs to Camille Flammarion himself: the blank paper is only completed by the astronomer's hand and mind. To 'draw' is to interpret what the telescope assists to a few: only '*l'astronome distingue et dessine les continents, les rivages, les îles de la géographie de Mars…*'

Later, in 1905, Camille Flammarion published, in the *Bulletin de la Société Astronomique,* the article '*Experiénces contre la réalité des canaux de Mars*' about the experiment held at Greenwich – with students (from the ages of twelve to fourteen) of the Royal Hospital School –, which claimed the inexistency of such Martian canals. Finally, he contradicts the English research by stating that only the astronomical 'hand' trains the eye:

> "(...) *Pour qu'une ligne, droite ou courbe, soit imaginée, il faut qu'elle soit amorcée, esquissée, par des pointes quelconques. Assurément, nous ne voyons par sur Mars la réalité. C'est trop loin. Mais les canaux observés indiquent l'existence réelle, à la surface de la planète, de configurations inconnues disposées en lignes droites."*[22]

The mediated 'view' will present that dual ambiguity of the primacy of the 'hand' and the restrictions of the 'eye'; a consequence of both that necessity of the knowledge production and its own objective limitation: Mars is never observed in its entirely; in its 'reality'. As Flammarion further states in the '*Chapitre IV - Aspect de Mars à l'œil nu',* inasmuch, the observation of Mars could be improved, given the impossibility to capture the planet at least

[21]Daston, Lorraine; Galison, Peter, "The Image of Objectivity", in *Representations*, No. 40, Special Issue: Seeing Science (Autumn 1992), University of California Press, pp. 81-128.

[22]Flammarion, Camille, "Expériences contre la réalité des canaux de Mars*"*, in *Bulletin de la Société Astronomique de France*, *L'Astronomie : revue mensuelle d'astronomie, de météorologie et de physique du globe*, Paris: Gauthier-Villars, 1905, pp. 274-283, p. 283

until the beginning of the twentieth century, the astronomer needed to outshine that limited availability:

> "*Nous devons donc sans tarder reprendre l'étude de cette quatrième province du système solaire, apprendre à la reconnaître nous-mêmes dans le ciel, à la trouver à l'œil nu, à l'observer à l'aide des instruments qui peuvent être à notre disposition, à nous rendre compte de sa position dans l'espace et de sa marche autour du Soleil;*"[23]

In the late-nineteenth century, the astronomers observing Mars concluded these limitations by what Camille Flammarion labels as 'natural synthesis': the detailed enunciation of the production of these views that turn out to be more authorial than their 'hand-precision'; more decisive to fight the scepticism against the Martian artificial canals theories:

> "*Mais, évidemment, tout en mettant une judicieuse sévérité scientifique dans le choix et l'appréciation des documents, il ne faudrait pas imiter le scepticisme de Napoléon auquel Arago montrait les taches du soleil, le grande conquérante n'a jamais voulu croire que ces taches n'étaient pas dans la lunette!*"[24]

With Giovanni Schiaparelli (1835-1910), the ground of popularization of his *Martian Artificial Canals* [**fig. 8**] is also symptomatic of this 'natural synthesis'. For the Italian astronomer to work under complex conditions was to use one eye to observe and one eye to quickly draw his sketches, as that Flammarion's first figure neatly showed[25]. Between August 1877 and April 1878, at Brera-Milan Observatory, Schiaparelli's observations on Mars resulted in an enormous collection of complete drawings of the Martian surface – one hundred detailed

[23]Flammarion, Camille (1884), pp. 70-71

[24]Idem, p. 150

[25]Canadelli, Elena, "Some Curious Drawings – Mars through Giovanni Schiaparelli's eyes: between Science and Fiction", in *Nuncius,* Vol. 24, Issue 2, 2009, pp. 439-464, p. 444

sketches – and in several Maps geographically named after Latin terms from the classical and mythological Mediterranean world[26].

Moreover, the Italian Astronomer's written annotations revealed the degree in which 'objectivity' was being fabricated. In his notes, one could find "emotional expressions", such as "It's wonderful", "I see well", "It shines like snow"[27]. For what I am trying to argue here, more important than the scientific complexity around these 'canals', Schiaparelli's case is primordial to understand how the production of knowledge about the Martian observations surpasses the 'observed' final representation. Thus, to better support his data, the use of detailed drawings, the written annotations and the constant references to the work of others respected observers became the perfect alternative to support the fragmented planet[28].

Revisiting again that first figure of Camille Flammarion looking through the telescope, that contingent 'perfect' moment of visibility is both present and being fabricated. Nevertheless, the 'telescopic view', as we will see, still requires more than the 'hand' to secure that 'visibility' was achieved. In order to these 'images of objectivity' contest any possible scepticism and the photographic automatism to come, they have to claim the synthesis of different information with 'ready-made' observations. To allow Flammarion to present a final image of Mars in 1884 – *Mappemonde Geographique de la Planète Mars* – 'objectivity' will also be supported by that synthesis on priorly made observations and their prior brightness 'shots'.

In the page No. 29, while presenting the figure No.16 [**fig. 9**], the astronomer writes:

> "*Parmi une quantité considérable de croquis dont nous avons la collection sous les yeux, dessinés par les meilleurs observateurs de l'Europe et de l'Amérique, nous*

[26]Lane, K. Maria D (2011), p. 49

[27]translated by Canadelli, Elena (2009), p. 444

[28]Lane, K. Maria D (2011), p.36

> *reproduisons (fig, 16) quatre forts belles vues dues à l'astronome anglais Green, qui s'était rendu exprès sous le climat si favorable de l'ile de Madère pour étudier la planète à l'aide d'un excellent télescope de 33 centimètres de diamètre, installé sur une montagne élevée à 660 mètres au-dessus du niveau de la mer et armé de grossissements variant de 200 à 400 fois, donnant des images extrêmement nettes."*[29]

The above description awarding both the climatic conditions, the place of observation and the telescopic tool's capacity enables Nathaniel Everett Green's observation to be 'objective' and Flammarion to contradict any form of scepticism. After all, the 'telescopic view' is both dependent on the 'viewing' and the 'telescopic' mechanical conditions. However, by being supported, the 'view' is also exposed in its own problematic existence: the 'view' cannot speak for itself and needs to enact a sort of automatism.

Moreover, the description is given in the page No. 29, but the '*fort belles vues'* are only offered three pages later (No. 32). The four numbered drawings are given in the middle of the page's text: by their intense doubled line controlling the cosmic darkness of the background, the frontal representation of Mars 'cuts' the page, as the planet 'cut' the telescope in that exceptional instant of visibility. Also, they are synthesis by analogy, selected by Camille Flammarion from Green's collection and then inter-compared, to show "*l'emsemble total du globe de Mars",* the gathering together enabling that planet's post-total.

Settled in *Les Terres du Ciel,* the 'view' echoes that post-contingent moment in the continuous of the text: catching the reader's gaze in the syntagmatic of the book, the 'view' subscribes an indirect 'now' but also a direct one. The reader is forced to 'walk' through the reading in order

[29]Flammarion, Camille (1884), pp. 29-30

to correlate both the textual with the visual. For instance, moments before in the page No. 28, Flammarion writes:

> "*Pendant l'opposition (1) de 1858, le P. Secchi a fait à Rome, en des conditions éminemment favorables aussi, un grand nombre de dessins dont nous reproduisons huit fac-simile, sur nous fig. 67 et 68. Les quatre de la figure 12 dont des 5, 6, 7 et 10 juin. Les neiges polaires y sont bien marquées: la mer qui entoure le pôle supérieur y est nettement visible, ainsi que la Manche qui en descend et que les continents qui s'étendent à l'est et à l'ouest. Les dessins de la fig. 13 sont des 13, 14, 17 et 18 juin ; ils présentent d'autres mers et d'autres continents."*[30]

Again, in the above description, the 'view' No.13 is also introduced by the text in a non-correspondent page: only the fig. 12 [**fig. 10**] is given in the same page of its description. As such, in order to strictly correspond the description with the other mentioned figure the reading gaze is forced to 'go' and 'look after' that moment when the perfect '*opposition'* was achieved*;* is forced to wait for that exceptional 'shot'.

Later in the Martian *Livre*, his fig. 49 [**fig. 11**] also neatly includes the reader in this 'interplanetary' ride for the best instant. Now, the 'view', from Camille Flammarion's production and copyrighted by Paul Fouché, is in the same page of its description and precedes the text:

> "*Ainsi par exemple, voici trois dessins faits le même soir (28 septembre 1877), le premier à 7 heures 30 minutes du soir, le second à 9 heures 30 minutes, le troisième à 11 heures 30 minutes: ils suffisent pour montrer que la tache circulaire grise a marché*

[30]Idem, p. 28

> *de la droite vers la gauche (pole sur en haut), et qu'en quatre heures elle a parcouru, en apparence, plus de la moitié de l'hémisphère…"*[31]

Like all the other 'views', this 'view' is also numbered and under-captioned. Nevertheless, this time, the title is more suggestive: '*Comment on observe la rotation diurne de Mars'*. Followed by the detailed daily/monthly/yearly/hourly description, this fig. 49 supports Camille Flammarion's didactic sense: the reader is turned into a '*voyageur*' also travelling within this journey to observe.

A final example is the fig. 66 [**fig. 12**]: a one-selection from M. Trouvelot's observations on Mars, between 1877 and 1879. The 'view' is introduced by the text, but not mentioned within it – as it was the case for the first two examples. Nevertheless, the 'view' also corroborates my argumentation line by cutting the sentence in the middle:

> "*C'est une observation que l'on peut*
>
> *(fig. 66)*
>
> *faire presque tous les soirées sur la Lune, que l'on a obtenu également pour Venus et Mercure, mais qu'il n'avait pas encore été faite sur la planète Mars.*"[32]

In this example, the reader's reading gaze is stopped by the 'view' in a deeply clever move: 'it's an observation we can achieve (break) almost looking every night to the Moon'. This 'we' followed by the 'moon' places the reader also 'there', as if in the astronomical milieu: what M. Trouvelot achieved becomes analogous to what the popular reader achieves by simply looking 'every night' to the Lunar Satellite.

[31]Idem, p. 100

[32]Idem, p. 141

Essential to any statement of truth, in the nineteenth century history of Mars' observations, is also the exodus from city centres to mountain-top or high plateau retreats[33]. Reclaiming that *Livre's* first figure again [**fig. 6**]: the astronomer is looking through the telescope, but also from a place. The observatory is neatly there: in the architectural structure; in the object pointing the transparent sky; in the surrounding picturesque landscape. Thus, the astronomer's movement away from the city could be, here, analogous to the reader's walking to clinch the chosen Martian scene: step by step, the reading gaze follows the knowledge production led by the astronomer into the field. *Les Terres du Ciel*'s *voyage* first trope – *le voyage astronomique* – never abandons the Earth, but doubles it: *le voyage* within *le voyage.*

Moreover, in the French meaning for *vue*, *scène* (scene) is also implicit. In this *mise-en-scène*, the textual descriptions are the surroundings that rend the final scene visible within the book. Within the pages, the 'telescopic view' becomes 'panoramatic': from the Greek *pan* (all) and *horama* (view), this panorama is also a 'total' view, not a fragmented one[34]. Like the panorama's conception of space, the 'view' also presents the past-fragmented-planet in its entirety: synecdoche was and is always implicit here. Though, more interesting than how the Martian subject is fabricated is how the reading gaze becomes that of an 'objective traveller'.

In late nineteenth century panoramas, that *mise-en-scène* was also primordial over the scene itself. Like the 'view', this medium had to reinvent itself after Photography's appearance: one of the ways to do it was to incorporate three-dimensional objects within the 'total tableau'. For instance, in the 1881's *Bataille de Reichshoffen* panorama, the painter Poilpot transformed his *tableau* in a *tableau vivant* [**fig. 13**] by incorporating tinsel on his canvas for weapons and for

[33]Markley, Robert, *Dying Planet – Mars in Science and the Imagination*, Durham: Duke University Press, 2005, p. 39

[34]In the "*Livre II: Notre jeune sœur la planète Vénus"*, Camille Flammarion actually uses the word 'panorama' to describe an imaginary view from Venus' Mountains - Flammarion, Camille (1884), p. 288

the military costumes and, more importantly, wax figures in between the canvas and the spectators[35]. Repeating Camille Flammarion's words about Green's observations:

> '*le climat si favorable de l'ile de Madère pour l'étudier de la planète à l'aide d'un excellent télescope de 33 centimètres de diamètre, installé sur une montagne élevée à 660 mètres au-dessus du niveau de la mer'*

Like Poilpot's panorama, *Les Terres du Ciel'*s 'view*'* verisimilitude can only be reinforced by the power of such 'realistic' and 'neutral' details: the size of the astronomical tool, the climatic conditions, the geographical surroundings are the objects 'evolving' the reader in a travelling experience *in situ,* never leaving the ground of the book. Now settling my *voyage astronomique*, the 'view' has surpassed its own 'malfunction': it is a panorama ruling the reader, by the means of metonymy, to achieve the instant of that past-contingent visibility. In the end, the drawing as a sort of automatism was the only alternative achieved to defeat its own progress.

(Re)claiming the meta-figure of Flammarion's Observatory [**fig. 6**], the panorama could also be presented: grounded on a circular base, the telescopic could be performing a certain rotation. In one hand, above Flammarion's hand, the drawing itself enacts a certain automatism. On the other, placed in imaginary higher-top sight alongside with Flammarion's godlike figure, authority is also supported. Moreover, the French Astronomer's authorial total 'view' is supported. Finally, in the page No. 36, the *Mappemonde Geographique de la Planète Mars' mise-en-scène* is also claimed:

> "(…) *Depuis un an, de nouveaux documents, dus surtout aux observations de MM. Trouvelot, à Cambridge; Burton, Dreyer, lord Rosse et Boeddicker, en Irlande;*

[35]Schwartz, Vanessa R., *Spectacular Realities: Early Mass Culture in Fin-de-Siècle Paris,* Berkeley, Los Angeles, London: University of California Press, 1998, p, 160

> *Schiaparelli, à Milan, Cruls, à Rio-Janeiro, nous permettent de construire aujourd'hui une carte plus précise encore, mais non encore parfaite et définitive assurément, car le progrès ne s'arrêtera pas."*[36]

After all, the *Mappemonde* preceded its own explanatory scheme: it couldn't really speak for itself, but needed to be guided by the conditions in which the blank paper is ready to be marked on. More importantly, like the 'view', the frontispiece is now also claiming an incompleteness in its authority: what wants to be total is haunted by the eternal sense of lacking. In the end, the Map was also a self-aware 'image of objectivity' originally challenged by the fatalistic photographic progress to come: '*car le progrès ne s'arrêtera pas'*.

[36]Flammarion, Camille (1884), p. 36

VOYAGE PITTORESQUE: 'photographie céleste'

Again, let me recover the meta-figure of Camille Flammarion in the Observatory. While the astronomer is looking and drawing one of his 'telescopic views', there is another presence at work behind his figure: the camera [**fig. 14**]. Attached to the wall, the photographic machine is omniscient, producing light and in a permanent state of work. This time, the 'machine' doesn't need an interpreter: the camera can actually 'speak' for itself.

Hanging in there and haunting Flammarion, the photographic machine seems to capture a "World seen without a self"[37]. Ann Banfield's use of Bertrand Russell's to Virginia Woolf's 'phantasmal' conception of space becomes useful here. In this meta-figure, the camera by being alone could be producing what Russell stated as "sensibilia": the unsensed sense-data. In other words, the appearance that things have even when there is no one to perceive them.[38] The camera is capturing what Banfield's gives as a crucial example following Russell's theory of perception: "Yet if you take the telescope, it brings into your sight a new host of stars that escape the naked eye"[39].

Nevertheless – and like Banfield further claims –, here the telescope, if receiving a continuous ray of data, is always dependent of the self to be visible: the machine is not grounded without a translator. On the contrary, for Camille Flammarion, the photographic machine obeys to a different 'view-pointer': the celestial. Russell's logical atomism could be perhaps linked to the Astronomer's conception of "Lumen" – the luminous ray of light permanently emitted by

[37]Banfield, Ann, *The Phantom Table - Woolf, Fry, Russell and the Epistemology of Modernism,* Cambridge: Cambridge University Press, 2000, p. 108

[38]Russell, Bertrand, *The Relation of Sense-data to Physics in his Mysticism and Logic*, London: George Allen & Unwin Ltd.: 1917, Reprinted Totowa, New Jersey: Barnes & Noble Books, 1951, pp. 108-131

[39]Banfield, Ann (2000), p. 120

things –, which comes perfectly illuminated in his novel *Lumen* (1887-1897) by the dialogue between Lumen and his young apprentice Quaerens:

> "Lumen: *Light, you know, does not cross instantaneously from one place to another, but in successive waves. If you throw a stone into a pool of tranquil water, a series of undulations form around the point where the stone fell. In the same way, sound undulates in the air when passing from one point to another, and thus, also light travels in space – it is transmitted in successive undulations."*[40]

As 'Lumen' explained Camille Flammarion's 'atomism' is what deconstructs things into ether constantly travelling through space. He, who, more than an astronomer, was a meteorologist, will also bring the atmospheric study to secure his Martian observations: alongside with Cartography, here, the spectrograph becomes another important authority. Born when Jansens, Huggins and Vogel attached spectrographs to the telescopes in order to study the chemical compositions of the light filtered through the Martian atmosphere[41], the instrument (re)echoes that mapping desire to frame the unknown with a tool initially fabricated to study the earthly down.

However, the spectrograph produces here something different from the Map. This 'otherness' by being studied through its radiation, becomes finally spectral, ethereal and detachable [**fig. 15**]:

> "*Nos lecteurs connaissent les principes de cette merveilleuse analyse spectrale, qui nous permet aujourd'hui de déterminer la constitution chimique des atmosphères planétaires. Sans revenir sur ces principes (1), rappelons seulement que les planètes*

[40]Flammarion, Camille, trans. A. A. M. and R. M. ["authorized translation from the French"], *Lumen,* New York: Dodd, Mead and Company, 1897, p. 33

[41]Markley, Robert (2005), p. 54

> *réfléchissent dans l'espace la lumière qu'elles reçoivent du Soleil, et qu'en faisant arriver leur lumière sur un prisme placé devant l'oculaire d'une lunette, cette lumière donne naissance à un petit spectre coloré des sept couleurs de l'arc-en-ciel, et qui est l'image parfaite du spectre solaire."*[42]

Already with the spectrograph, Mars is only visible by that chemical entity of the 'Lumen'. Thus, to better understand the implications of the 'celestial photograph' throughout the Martian *Livre*, more important than the object's technical frame is that first assumption of 'data without a self': knowledge production aims to be no more a translation given by that 'selfish-astronomical-hand'. Again, let me reclaim the meta-figure [**fig. 6**]: while the French astronomer is operating the telescope, the suspended machine becomes independent of his self. Finally, in this receptive work-station, is there someone behind the camera?

Let me start with the emitter, 'Lumen' is the celestial entity who carries photographs in delay:

> "Lumen*: the appearance of things, borne to us by light, shows us those things not as they are at present, but as they were in that period of the past which preceded the interval of time needed for the light to traverse the distance which separates us from those events. We do not see any of the stars such as they are, but such as they were when the luminous rays that reach us left them."*[43]

Suspension and interruption is how this second category of figures will rule the reading gaze in the book. In *Les Terres du Ciel*'s page No. 9, the reader encounters the first 'celestial photograph' of the Martian *Livre*: the page-sized illustration presents a scene in Venice of the old days, again signed by both Fouché and Kemplen [**fig. 16**]. This figure is never mentioned

[42]Flammarion, Camille (1884), pp. 126-127

[43]Flammarion, Camille (1897), p. 37

within the text, instead it works to illustrate Flammarion's words. Meaning, not-numbered and captioned with the textual fragment "*...Nous les prenons à temoin de nos serments…",* the 'photograph' works by repeating, but cutting the text just given in the preceding page:

> "*Nous croyons qu'elles nous voient, qu'elles nous entendent; et nous les prenons à témoin de nos serments. Mais l'Astronomie nous a fait connaître leurs distances, nous a montré en elles des soleils et des planètes, et nous a appris que ces planètes sont des terres analogues à la nôtre."*[44]

Contrary to the 'views', the 'celestial photographs' – the majority page-sized – don't break the page, break the book. Not in the page, each 'photograph' is a page by itself cutting *Les Terres du Ciel*'s writing flux: the reader's reading gaze is suspended to then face a new page 'intruder'. For instance, the above-mentioned 'celestial photograph' is on the page No. 9, indeed, but that number is not showing: the reader only acknowledges it if particularly interested in the page-count.

Visually, the 'celestial photograph' presents the text metaphorically by showing three figures in a Venetian gondola pointing to Mars in the shining sky. Textually, it presents it metonymically: the words, fragmented by the use of parentheses, are then also transformed into that floating ether. As such, if the word is still present in page No.9, it only survived as visual segment: that state of entropic energy increasing within time; that message converted into visual code. The word becomes a sort of telegraphic intrusive-communication that Camille Flammarion often refers throughout his 'view-pointing' pages: "*la nouvelle fut télégraphiée aux principaux astronomes du monde…"*[45]

[44]Flammarion, Camille (1884), p. 8

[45]Flammarion, Camille (1884), p. 152

However, more than telegraphic, they are a sort of pantelegraphic: that technology registered by the Italian Giovanni Caselli in 1861; that telegraphic renovation after photography's appearance. More than the telegraphic new ability to send pictures down a telegraphic line, Caselli's main invention was supposedly the non-dependency of an operator carrying the message to the next post[46]. As Richard Taws explained about this technology: "Contained in the dark rooms of the telegraphic bureau, the pantelegraph did not figure as image, but instead gave rise to images of its own making"[47].

Finally, that anthropomorphic sense of a technological machine 'self-sufficiency' is analogous to that which Camille Flammarion believes 'Lumen' to be*:*

> "Lumen*: In order to be still more exact, the light represents a courier who brings, not written news, but photographs, or, strictly speaking, the real aspect of the country from whence he came. We see this living picture such as it appeared, in all its aspects, at the moment when the luminous rays shot forth from the distant orb."*[48]

As 'Lumen', the pantelegraph is also that electric entity that is expected to be a self-sustaining communicator. In addition, the electric current synchronized between two pendulums was giving rise to other forms of inscription, such as portraits, signatures, plans or any kind of image[49]. Thus, "rather than maintaining a strict division between image and text", the result combined both in a "powerful visual message"[50]. If, mechanically, the 'celestial photographs' represent a retrocession in 'wood-engraving' while compared to the 'view', which arranged

[46]"The pantelegraph's operation did not depend on an operator discerning a visual sign and conveying it to the next outpost" - Taws, Richard, *When I was a Telegrapher*, 14th December 2014, Stable URL: http://nonsite.org/article/when-i-was-a-telegrapher (09/08/2016)

[47]Ibid.

[48]Flammarion, Camille (1897), p. 35

[49]Taws, Richard (2014)

[50]Ibid.

both image and text in the same spatial conjunction, they also work to reform the text in a 'visual message' floating in the lighting wave to be later crystallized on the page.[51]

Nevertheless, my interest in this textual-visual analogy between both technologies is in the level in which their 'self-sufficiency' desire troubles any form of 'authority'. As Richard Taws states giving the example featuring in the Museum of Arts et Métiers collection [**fig. 17**], in some copies of dispatches, there was a gap in between the authority making the drawings and writing the text: in between – as Taws explains citing Talbot – the "pencil of nature" and the pencil of the hand[52], meaning, that an authorship was indeed present, but was unwanted. Non-mediation, even if an uncertain statement, was the pantelegraph's expectation as it is for the 'celestial photograph': if the textual is to be repeated by the chemical entity, its rooted authority wants also to be displaced.

Here, the textual as appearance aspires to be no more a translation given by Camille Flammarion: displaced by 'light' to the 'celestial photograph's' page, the word loses its data-authority and is transferred to that something/someone behind the wall. Doing so, Flammarion cleverly uses these 'photographs' as something that precedes his data-self and his authorial responsibility; the automatism is finally conquered. This paradoxical 'neutrality' of a data 'without a self', which Ann Banfield also contests, could be read here together with her notion of indirect speech syntax: presented with "determinable possibility, the disturbing presence of something impersonal, inhuman, past and, in that instant, distant", the reader becomes the only witness facing the displacement of the narrator-self[53].

[51]It is still uncertain which were the techniques used by the illustrators in *Les Terres du ciel* (edition of 1884). However, through their representational effect within the book, both categories of illustrations already serve the main argument purposed here.

[52]Ibid.

[53]Banfield, Ann (2000), p. 267

In the page No.13, another 'celestial photograph' is introduced: "*Vue de Mars, dès le coucher du soleil, la Terre brille dans le ciel comme une étoile…"* [**fig. 18**]. Here, the picturesque landscape presents a Martian sunset where the reflected light is what enlightens the labyrinthic watery; the multiple intersection of canals that both Flammarion and Schiaparelli were representing at the time. The reader's position could be that of an outsider to the frame, but that 'Lumen' identity is gazing his/her eye right in the centre of the composition. Thus, the reader is then to confront that moment of 'distance' when the present impersonal identity is not only displacing Camille Flammarion's words, but also displacing sight itself:

> "Lumen: *No light, lucidity, colours, looks, tones, noises, harmonies, sounds, perfumes, flavours, apparent qualities of bodies, &c. are nothing but forms*. *These forms enter into your mind by the avenue of the eye, and the year, by the senses of smell, and taste, and are represented to you by their appearances, but not even by the essence of the things themselves*."[54]

Space, here, is that presentation of sight also in an indirect form of speech. Losing its authorial roots to 'Lumen', place is doubled into an appearance and a movable one. Acceding to an 'interplanetary' state, place can travel from point A' to point B' only as representation. In fact, inasmuch as exteriorising the reader's presence into the Martian landscape, it also enables that degree where vision and touch are the substitutes for sight: transposed to the page, the landscape becomes an indexical exterior now interior. Like a post-card, the photographic conquers 'settlement' by its movable enactment.

Now, knowledge production happens within the image, within the situational of its representation; the interior environment that shapes it as double. For instance, when compared

[54]Flammarion, Camille (1897), p. 102

to the 'views' different forms and sizes – the paradigmatic cut on the syntagmatic of the text – , the 'celestial photograph' is also a 'now', but that of a different cut: breaking both the syntagma and the paradigm of such 'views'. Consequently, this new intrusive break is not for practical correlation, as the reader is the only presence behind the wall, behind Camille Flammarion's authorial walls, where words become rootless and the landscape becomes shape.

Whilst a direct narrative is being performed, in this indirect-narrative, the reader – faced with that displacement of the self-data – has the opportunity to work with the self-reference of such forms: what shapes the landscape into the photographic rectangular abstractness also arranges the book into an unpredictable repetition of such rectangular form. From the original Venetian landscape to a '*Vue de Mars'* where the planet Earth is presented in the imaginary Martian sky, to a non-where landscape where human presence is still represented in the first plan [**fig. 19**], slowly the reader is led into the familiarity of strangeness.

The uncanny is always dependent on a certain familiarity: what it concealed is also expected[55], what will be new is to be familiar. On the page No.177, the reader, presented with the caption – "*...Là descend du ciel une autre lumière, là fleurissent des plantes qui ne sont pas des plantes..."* [**fig. 20**] – encounters a 'photograph' where human presence is finally absent and substituted by the vegetable 'other'. Inasmuch as the organic forms render the reader as an outsider, the water undulation conducts the reading gaze to that higher-point between the Martian Mountains. Reminding that instant of 'visibility' at the Observatory, the reader becomes an almost self-sufficient astronomer, even if an amateur.

Throughout the pages, the reader's gradual familiarity with the narrative displacement drives him/her to enact a sort of authority – also by analogy –, but, this time, by collecting Martian

[55]Freud, Sigmund, *The Uncanny,* London: Penguim Books, 2003

'post-cards' and 'post-photographs'. From Venice to Mars, the Lumen's indirect-self slowly directs the reading gaze in a change of altitude but also of latitude: whilst Flammarion is pointing to the past-contingent moment of visibility, these intrusive pages offer an opportunity to experience a lateral narrative – where data is completely irrelevant and where absorption is a matter of perceptive synthesis on analogy.

Thus, the 'celestial photograph' can speak for itself, yet unveiling that the scientific couldn't. In one side, the scientific knowledge needed to be turned into a 'beautiful tableau' to include that liminal '*sympathie'* of the amateur. On the other, to the 'telescopic view', its '*progrès'* to come is already happening in *Les Terres du Ciel*'s intrusive pages.

Finally, on page No. 209, the last 'celestial photograph' in this *Livre* presents a couple, neatly Camille Flammarion and his wife [**fig. 21**], pointing to that spectacular past of ruins, as claimed just moments before within the text:

> " – «*Nations, patries! Répondis-je; croyances, religions, temples, palais, tout passe! et la Terre elle-même, et les cieux…Mais la vie, la jeunesse, l'amour, ne passent pas…(…).*"[56]

This time, it is not 'Lumen' reflexion on the water flow guiding the reader's gaze through the vanishing point, but the palimpsest of lost worlds and, again, the pointing hand of the French Astronomer. Captioned with "…*Nations, patries, religions, temples, palais, tout passe!...',* the final 'celestial photograph' is not of an indirect speech but of a direct claim that the '*progrès'* to come is already a fraud before the fraud: everything passes…

[56]Flammarion, Camille (1884), p. 208

Working alongside the drawing authority, the symbolic use of the 'photographic' prescribed to its 'objectivity' to come already a suspicious anxiety before its actual arrival. Finally, the combination of both narratives leads both authorities to a point of intersection, but also of disconnection: *Les Terres du Ciel*'s real photographic ambition is not for the total erasure of the 'selfish-astronomic-hand', but for its repetition in delay. Pointing his hand to the palimpsest of lost worlds, Camille Flammarion states, here, his broader expectation: that of the conservation and the survival of his authority.

Returning to the beginning of this *Livre,* that camera haunting Flammarion in his Observatory, also challenges him: Cartography needs to believe it won't last, in order to last. As I will argue in my next chapter, the astronomer's sense of 'Lumen' will prescribe that complex 'lateral' sense of time in which the 'now' is continually haunted by its eminent state of being a past in the future. Thus, the fatalistic forward can only be solved by the narcissistic desire to be turned into memory. Now, Camille Flammarion will teach how to look back.

VOYAGE MÉLANCOLIQUE: 'vue narcissique'

The last 'celestial photograph' concludes what the first meta-figure had already stated [**fig. 6**]: the light projection that 'haunts' Camille Flammarion is not simply that of the photographic future to come, but that of his 'photographic' now. After all, the camera could be also capturing him:

> "*There is here, then, a surprising transformation of the past into present. For the star observed, it is the past – already vanished. For the observer, it is the present, the now. The past of a star is strictly and positively the present of the observer…What we believe we see now in the stars is already past; and what is now being accomplished we do not yet see."*[57]

Pointing to the palimpsest of lost worlds [**fig. 21**], Camille Flammarion's also acknowledges his present: the present of the observer is that of looking back on time. Nonetheless, on the same token, that which is present is already in duration, in time. In a Bergsonian way, the present as a photographic still will also go by… 'Lumen' will transport it to the infinity of the future, where that 'shot' will be observed as already past[58]. In this meeting where past comes forward to encounter the present, the present also accepts its own complex temporality: that of being in length; being dependent on that void to which Flammarion's hand is pointing – time itself.

[57]Flammarion, Camille (1894), pp. 616-617

[58]Bergson, Henry, "Of the survival of Images. Memory and Mind", *Matter and memory,* London: Swan Sonnenschein, 1911, pp. 170-232

Thus, *Les Terres du Ciel's* '*technological ekphrasis'* is profoundly raised in that statement by Camille Flammarion of 'What is now being accomplished' that 'we do not yet see' and in my statement 'It's hard to look down when you look up'. Placing himself in front of the ruins of the lost worlds, the illusionistic phantasmagorical past is secondary when it becomes the only mode for the 'now' in forward to grasp its infinity to come. 'What we do not yet see' is not only the 'otherness', but also the present on the march, the liminal time in between the immediate past – already lost – and the unpredictable future.

Until now, I have been argued how *Les Terres du Ciel'*s journey tropes were used as a form of narcissism to sustain a certain authority where knowledge production and popularisation were the eminent goals. Now, this third *voyage* won't be about that doubled place of departure, but about the double of an earthly-duration, which, by being constantly in forward to a tending future, wants to perform a slow motion in time, in its 'now' time. Contrary to the 'telescopic view' and the 'celestial photograph', the 'narcissistic view' is that which dilates both of them in the final *thelos* of the Martian *Livre:* its 'now' challenges the future by wanting to observe it.

Already in the '*Chapitre IV - Aspect de Mars à l'oleil nu',* on the pages No. 74 and 75, for instance, two astronomical artefacts are rendered as figures: firstly, "*de médailles de l'empereur Antonin, frappés en Egypte l'an 145 de notre ère*" [**fig. 22**]; secondly, "*horoscope de Louis XIV tiré le jour de sa naissance*" [**fig. 23**][59]. Together, the two figures present that anachronism when Astronomy was strictly directed to the everyday; when Astronomy was performed in a more theological state, which Camille Flammarion nostalgically reminisces:

[59]Flammarion, Camille (1884), pp. 73-75

> "*Ces observatoires, ces palais, ces jardins suspendus, ces temples, se sont écroulés. Les bibliothèques, les salles de lecture, les lecteurs, les curieux, les passants ont été ensevelis sous les décombres. Les yeux qui observaient se sont fermés ; les corps qui agissaient se sont couchés pour ne plus se relever ; il n'en reste rien (...)*"[60]

Nevertheless, more important than Flammarion's theological side, is how these introduced medals corroborate his sense of immersion of the past into the present:

> "*Nous avons sur ce point de fort anciens documents, entre autres une série de médailles de l'empereur Antonin, frappées en Egypte l'an 15 de notre ère, précisément à l'époque ou Ptolémée rédigeait l'Almageste. Ces médailles sont actuellement à Paris, à la Bibliothèque nationale;(...)*"[61]

For instance, with the medals '*actuellement à Paris, à la Bibliotheque nationale'*, displacement is necessary for memory as form of apparatus: what prevails is only the phantasmagorical artefact in the 'actuality' of the *Bibliothèque nationale*. Exactly the same is happening with Camille Flammarion's pointing hand [**fig. 21**]: the selective past is brought together with the present of his archival-authority. In these examples, the past becomes only remembrance when settled into the present, but then what will be the remembrance of the 'now'?

Solving this 'invisibility', the 'narcissistic view' will become a sort of Étienne-Gaspard Robertson's magic lantern. However, contrary to Robertson's shows, which capitalized the gothic taste for horror –, here, what projects the past as phantasmagoria also haunts the present to become: the 'ghosted past' is transferred to a backstage position and the 'now' is the veritable haunted entity. Again, settled in the lost path of old civilizations, Camille

[60]Idem, p. 82

[61]Idem, p. 71

Flammarion's hand already belongs to the 'photographic still'. He is already a phantom projected by the magic lantern: the magic lantern of an actuality in the near future.

As I have already stated, Camille Flammarion's 'Popular Astronomy' follows the line of François Arago's scientific approach embedded in journalistic immediacy and didactics. As such, the phantasmagorical apparatus is not new here. For instance, in February 1851, in the Meridian All of the Observatory of Paris, Arago organized a prominent show: Léon Foucault's pendulum. Journalists and scientists were invited to see the rotation of the Earth to celebrate the new triumph of science[62]. In this dissolution between Science and Spectacle, the phantasmagorical sense of Robertson's shows was still present in the movement of the immaterial magnetic pendulum. More importantly, the phantasmagorical ambient was the trope used to diffuse the actuality of such discovery: the earthly rotation, the earthly duration.

This new temporal apparatus is also symptomatic of the use of light projection in late nineteenth century shows, framing the steps of the early-cinema. For instance, Emile Reynaud's Praxinoscope developed in 1877 – a ring of mirrors moving around its axle to reflect a revolving band of sequenced drawings placed against the circumference of its outer rim [**fig. 24**] – was later improved to the *théâtre optique* and 'acquired' by the *Musée Grévin* in 1892. The show was advertised as *Pantomines lumineuses* featuring three cartoons – *Pauvre Pierrot, Un bon bock,* and *Le Clown et ses chiens* –, and, as *Le Figaro* explained at the time, "*they give the complete illusion of life…"*[63]

Not projecting ghosts of the death, this sort of new 'magic lantern' was projecting 'ghosts' of life. Like Foucault's pendulum, these early cinematographic devices present a new sort of

[62]Tresch, John, "The Prophet and the Pendulum: Sensational Science and Audiovisual Phantasmagoria around 1848", in *Grey Room*, No. 43, Spring 2011, pp. 16-41, p. 33

[63]Schwartz, Vanessa R., (1998), p, 181

phantasmagoria: the coverage of an 'actuality' by a memory apparatus. Later in 1898, Camille Flammarion would also go cinematic, projecting two 'celestial' films: one actually presented to the members of the French Astronomical Society[64]. More importantly, what was to become cinema is already the brotherly figure of *Les Terres du Ciel* – through synthesis or montage – time becomes "the indirect image of time", again, dependent on something else[65].

Also, when looking closely to the first meta-figure in the Observatory [**fig. 6**], the Praxinoscope could also be present: the camera's 'ray of light' could be projecting the 'views' and the telescopic base could be (again) rotating. Therefore, its 'authorial moment' could also survive as stardust. Finally, now the 'view narcissistic' is what synthetises both the 'telescopic view' and the 'celestial photograph' for its own narcissistic framing device: not only to be a view in delay – in the movement of time –, but also to assure a temporal 'indirectness' gazing back.

In the last chapter of the Martian *Livre,* Camille Flammarion promises to give the subsequent information:

> "*Les habitants de Mars. – Conditions de la vie sur ce globe – Lois de la nature et forme des êtres : anthropologie comparée – État du séjour martien. – Le Ciel et La Terre vus de la."*[66]

Ending the Martian *Livre*, Camille Flammarion's popularisation also intends to populate Mars, yet, as we will see, challenging what might be expected from a geographically embedded discourse about foreign landscapes and 'peoples'. The 'other' will only serve *Les Terres du Ciel* as liminal time: to (re)encounter memory by that intersection of a past-present with the

[64]Nead, Lynda (2007), p. 231

[65]Deleuze, Gilles, "The movement-image"*, Cinema 1*, London, New York: Continuum, 2005, p. 30

[66]Flammarion, Camille (1884), p. 167

future. The Martian becomes that 'something else' gazing the phantasmagorical light projected by the Observatory's wall.

Firstly, following evolutionistic theories, Astronomy is also led into the field of Biology, into Darwin's natural selection. Already in page No. 17, a 'celestial photograph' presents '*Le monde de la mer est déjà tout différent du nôtre…'* [**fig. 25**]: the 'photographic' reaches a microscopic state showing that the minuscule water drop is already infinite, a flux where different evolutions coexist. *Les terres du ciel's* water is messianic: a reflexive surface that enables the conservation of multiple times and the mirroring of our own time. Like the water, the 'narcissistic view' aspires to be the same.

Now, in the end of the Martian *Livre*, Camille Flammarion gives the subsequent line:

> "*Les couches géologiques du globe terrestre, que nous retournons aujourd'hui comme les feuillets d'un livre, nous montrent ainsi cette succession de fossiles ensevelis. Les espèces se sont succédées en se développant graduellement, comme les rameaux d'un même arbre."*[67]

Walking alongside the French astronomer's words, from pages No. 187 to 189, the reader is led into a taxonomic journey throughout the origins of human species. The figures No. 88, 89 and 90 [**fig. 26, 27, 28**] cut the narrative, like the 'telescopic view' did, to show the human state of becoming 'now', yet a 'now' in duration:

> "*Nous avons conservé, encore aujourd'hui, des organes rudimentaires atrophiés, qui ne nous servent absolument à rien, et qui proviennent de nos ancêtres animaux…"*[68]

[67]Flammarion, Camille (1884), p. 184

[68]Idem, p. 186

Thus, in *Les Terres du Ciel,* 'Darwinism' is what assures the 'otherness' as a conversation about duration: the seed that populates the 'other' land as time. Nevertheless, Mars is smaller and with an inferior density, therefore, the Martian-other could never be analogous to the earthly-human body. Here, what seeds the 'other' still allows its own roots: the Martian is bigger but never human; the Martian is an organic form. The 'other' is either a higher vegetable form or an animal form that can go higher, while the human can't:

> "*Les tentatives faites pour s'élever dans les airs à l'aide d'ailes construites dans ce but n'ont pas réussi sur notre planète et ne peuvent réussir, parce que la pesanteur nous fait tomber de 4 mètres 90 centimètres dans une seconde, et que le mouvement des ailes s'appuyant sur l'air ne peut nous élever de la même quantité dans le même temps. Mais un tel état est naturel sur Mars."*[69]

Quickly, altitude is changing and the Earthly-like Mars is transformed into the Martian-like Earth. Until now, if the 'imaginary geographies' were a form of empowerment – a possible analogy of a terrestrial engineering actuality –, the superior Martian, in the end, is the ultimately powerful species. In this body-mirror effect, Icarus fails again: the human body is facing a new chimerical form. Facing the 'other', the body acknowledges its mutability but also a 'new' lack in the whole: the wings. In the future, the Martian-like earthly body losing what is evolutionistic biological unnecessary, gains what is required to be evolved: the stereotyped unsettled body is formed in a still unsolved earthly aeronautics.

Therefore, the Martian animal flies a turbulent logic: whilst the Martian body is biologically projected, its 'distant' extension is what serves the narcissistic drive of *Les Terres du Ciel's* real Icarus. The true empowerment is here – not in settlement – but in the gaze again:

[69]Idem, pp. 192-193

punishment becomes a trope to assure that the 'other', while a mutable body, is superior, evolved and capable of being technological:

> "*C'est probable puisque sans doute ils sont plus anciens que nous sur la scène du monde et par conséquence plus avancés."*[70]

Moreover, the earthly-evolutionistic-duration is assuring the 'other' as astronomical:

> "*Ainsi, sans doute, le progrès de la pensée a suivi, sur Mars comme sur la Terre, le progrès de l'astronomie."*[71]

Finally, being the brotherly planet older, Mars is in the Future and can project the Earth's present-past by receiving lost light of information. Thus, on the page No. 204, the final 'telescopic view' is given – the narcissistic view – *Aspect de la Terre vu de Mars (juin 1881)* [**fig. 29**] followed by the subsequent description:

> "*Ajoutons encore que si les habitants de Mars on inventé des instruments d'optique, la plus petite lunette suffit pour faire reconnaître les phases de la Terre et montrer notre planète sous uns aspect analogue à celui de la petite figure ci-dessus (93)."*[72]

Now, what formally could be considered a 'telescopic view' needs to be different, needs to be a cinematic *mise en abyme*: not only does it grasp the Earth by the imaginary eye, but it is also self-sufficient. On the one hand, this time, the lens doesn't need to justify its capacity to show that the content of the 'other' is us: Earth is also the most visible planet from Mars. On the other, the phantasmagorical 'view narcissistic' is in no need to claim 'visibility' since the Martian is itself the Observatory's retreatment: an organic surrounding, but technological

[70]Idem, p. 201

[71]Idem, p. 202

[72]Idem, pp. 204-205

superior. The Martian nature, evolving in a boundary-duration, guarantees an 'urban exodus' in altitude achieving the perfect visibility of the down.

As *Nebula concepts* have shown the appearance of stars under their outline blurred, as Darwin has shown how things have been evolving over time, Mars also assures that, in infinity, the remembrance of the earthly-present is gazed in the liminal time of the future Martian; the liminal time of the future reception. Moreover, the Martian 'other' concludes that which the two last authorities have already concluded – independently of the body or place, reading and perception, here, are about time. In this final *voyage* to Mars, the reader mimics the Martian's *voyage* to memory: that of the Earth in June of 1881, that of Camille Flammarion's authorial time.

Reclaiming again the last 'celestial photograph' of the Martian *Livre* [**fig. 21**]*,* pointing his hand to the ruins of the past, Camille Flammarion is promising the contemplation not of a place, but that of a time:

> "*La contemplation de ces autres mondes produit en nous une impression offrant certains rapports avec celle qui résulte de la contemplation des villes du passé. Ces mondes sont éloignes de nous dans l'espace comme ces villes sont éloignées de nous dans le temps (...).*"[73]

However, as I have already argued, more important than the presence of the past coming to meet the present is what is settled in the composition's front plan: this time, it is Camille Flammarion gazing at the reader, not 'Lumen's neutral entity. Concluding the Martian *voyage,*

[73]Idem, p. 206

fiver pages after the 'narcissistic view', Camille Flammarion is the real presence in the liminal space where infinity turns everything into memory:

> "*Sur ces mondes, comme sur le nôtre, il y a des cités assises à tous les étages de la gloire et de la puissance ; la, comme ici, il y a des Rome, des Paris, des Londres, des autels et des trônes, des temples et des palais, des richesses et des misères, des splendeurs et des ruines. Et peut-être que du haut des vestiges séculaires d'une antique capitale, il y a en ce moment sur la planète Mars un couple amoureux contemplant les témoignages de la grandeur et de la décadence des empires, et sentant qu'a à travers toutes les métamorphoses du temps et de l'espace, la Vie éternellement jeune domine dans l'univers, régnant a jamais sur tous les mondes, et versant une jeunesses sans fins par les rayons d'or de tous les soleils de l'infini!*"[74]

In the end, the reader witnesses not the displacement of the narrator authority, but the placement of *'la Vie éternellement jeune*' – 'the young eternal life' – in the infinity of time. As such, the last words of the *Livre* point right back to the origin of *Les Terres du Ciel*: the book's frontispiece. Placed at the beginning of the book, the Martian Atlas assured a present that is looking back to the astronomical time. Placed at the end of the *Livre,* Camille Flammarion assures a future that will look back to his Mapping time: the technological unpredictable future should also perform by synthesis and conserve that Flammarion's present-past time.

If evolutionistic theories have offered a certain directive during this last *voyage*, that consistency also works as a memory guide: recovering the past should be the intrinsic desire of any future scientific data – only by grasping the origins, can the future be renewed. Finally,

[74]Idem, p. 210

if memory is also to be synthetic – performing in acquisition and retention of information[75]–, its selection process is what challenges the book's desire for its own *survivance*, for the 'Martian' gaze of 1881: that which selects immanently fears not to be selected. After all, concluding *Les Terres du Ciel*, Camille Flammarion's hand wants also to be an exceptional moment of visibility: a cut in the time flow when his '*quand j'étais un astronome*' is chosen to be remembered.

[75]McNamara, Patrick, "Bergson's 'Metter and Memory' and Modern Selectionist Theories of Memory", in *Brain and Cognition,* No. 30, 1996, pp. 215-231, p. 217

CONCLUSION

When finally, in 1905, Percival Lowell's (1855-1916) assistant C. O. Lampland 'photographed' the Martian Canals [**fig. 30**], a telegram by Lowell stated the same expectation of Flammarion's narcissistic view: "We wonder if Mars is photographing our Panama Canal"[76]. However, in 1905, the American astronomer still did not solve Camille Flammarion's intended photographic resolution: '*le progrès'* to come was still to come.

Lowell's Martian canals photographs were still turbulent: small and grainy, the photographs contained the shadow lines of such canals, but they were nonetheless insufficient[77]. Thus, two years later, Lowell embarked in a journey to South America aiming for better photographs; the results were again disappointing, so unconvincing that the American astronomer even desired to "retouch" them before their official presentation[78]. Finally, years after Camille Flammarion's Martian Atlas of 1884, Lowell's photographs still echo, more than Schiapparelli's Cannals Theory's complexity, a mapping production.

On the same token, in *Les Terres du Ciel,* mapping was almost already a 'photographic' medium: the struggle for the exceptional moment of visibility is that of a photographic shot. As I have argued, the symbolical use of the photographic prescribed to the 'camera' states almost a fraud before the fraud. Moreover, together the 'telescopic view' and the 'celestial photograph' were not two species fighting for survival in the narrative, but, being both in constant exchange throughout the pages of the *Les Terres du Ciel*, their actual struggle

[76]Lane, K. Maria D (2011), p. 195

[77]Idem, p. 54

[78]Idem, p. 55

surpassed the conquer for mere 'objectivity'. Together, what they really aimed at was to become a visible trace, to become 'popular'.

Thus, I would like to conclude my analysis by presenting some other lands populating *Les Terres du Ciel*'s various *Livres* to show how Camille Flammarion's book is itself messianic.

In my introduction, I have presented *Les Terres du Ciel*'s frontispiece as the concluded 'book to come', because it already announced the Martian *voyage* as that binary temporality between the authorial synthetic past and the authorial analogical present, but what I have left out – the future – was also on its surface. The Martian Atlas is given on an exceptional page from the rest of the book's pages; it is transposed to a coloured page where the reader's touch feels an exceptional texture [**fig. 31**]. The Martian Atlas is the real page intruder, but the frontispiece is not alone.

In the Moon's *Livre,* for instance, in the page No. 465, following the French astronomer words, the reader can already clinch what will come afterwards:

> "*Notre planche V reproduit une des meilleures photographies de la Lune qu'on ait obtenues. Elle est due à l'habileté de l'astronome américain Rutherford. (…) Sur les photographies de la Lune, les différences de teinte entre les mers et les régions montagneuses sont beaucoup plus marquées qu'à la vue (…)*"[79]

Two pages later, the detailed Moon is given not as a 'view', but as a black and white photograph – 'due to the ability of Rutherford' – as a *photo collée* stamped to a page where texture is again of a different touch [**fig. 32**].

[79]Flammarion, Camille (1884), p. 465

Moments after, Camille Flammarion continues with James Nasmyth's prominent moulded photographs of the Moon's surface:

> "*On se formera une idée exacte de la nature des terrains lunaires par l'admirable photographie que nous avons reproduite sur notre planche VI; elle est due au talent et à la longue persévérance de Nasmyth, et est extraite du magnifique ouvrage que nous avons déjà signalé plus haut à l'attention de nos lecteurs.*"[80]

Four pages later, Nasmyth's artificial lunar mountains [**fig. 33**] are finally given and, again, the smoothness of the plaster models can be felt in the page's materiality. That is a selection of Nasmyth's plaster models photographed and reproduced firstly in his and James Carpenter's *the Moon: Considered as a Planet, a World, and a Satellite* (1874). Selected and then transferred to that page in *Les Terres du Ciel*, Camille Flammarion is not hiding a camera work that is also about knowledge production. As artificial as the drawing hand of the astronomer, its photographic 'mapping' is also exposed.

Curiously, Mars and the Moon are the only two 'Lands of the Sky' ever mapped by Camille Flammarion's to a three-dimensional globe [**fig. 34**]. However, even if acknowledging that the lunar land was also a prominent place for earthly speculations at the time, what is relevant here is how both the Map and these photographs are given within *Les Terres du Ciel* as equals, as exceptional traces. Meaning, whereas the photographic exposes the mapping incompleteness, the Map also exposes what is photographic expected: colour.

As an archive, Camille Flammarion's book sabotages its own sabotage. *Les Terres du Ciel*'s "proper traces" are more than exposed, they superimposed the archive itself: like the Martian biological body, they conserve a certain 'originality' in the extension of the book's

[80]Idem, p. 483

reproducibility[81]. Their page's exceptional materiality suggests not something that wants to be effaced, but something wanting to be conserved in the eminent effacement of the archive's 'originality'[82]. They are the selected-selection by the godlike hand of the collector in the polytheistic assemblage of the book: *'photographies célestes, vues télescopiques, cartes et nombreuses figures'.*

In the end, if the 'technological' acceded the stage of allegorical, obsolescence does too: the Martian Atlas and its equals are, here, the veritable 'messiahs'. Obsolescence doesn't hide itself from the future to come, but acknowledges its sense of responsibility to a future on the march. They are icons that, by accepting their analogical and synthetic character, also expose their fatal 'incompleteness' constantly dependent on their comparison. Their power of enunciation and conservation is what secures that they are to become comparative data in any *temps* to come.

Now, in Camille Flammarion's future – the twentieth-first century – in 28th September 2015, NASA finally announced the existence of that messianic water on the Martian Planet: Mars is again habitable, not by the Martian engineers but possibly by future human travellers. More importantly, in NASA's website, offering a *Mars Chronology – Renaissance to the Space Age* – in the tab showing the year of 1892, Camille Flammarion's memory is finally chosen:

> "*Nicolas Camille Flammarion publishes Volume 1 (608 pages) of his encyclopaedia of La Planète Mars et ses Conditions d'Habitabilité (Gauthier-Villars et Fils, Paris). Telegraphing to Mars with solar signals in The Spectator, Ap 13. This is one of the first articles that deals with the language problems involved in communicating with the*

[81]Derrida, Jacques (1995), p.14

[82]Benjamin, Walter, "The Work of Art in the Age of Mechanical Reproduction" (1936) in *Illuminations*, trans. Harry Zohn, Fontana Press, 1973, pp. 211-244.

> *Martials (sic). The article points out that mathematical information may perhaps be exchanged, but questions how we will communicate abstract concepts: "How are we to ask if Martials [sic] have engineers and ships, and electric lights and glaciers and five senses, and heads and feet . . ." [Ed.- note that sometimes in the 19th century, Martians were referred to as 'Martials']. Camille Flammarion suggests communication with the Martians. Flammarion was familiar with experiments Edison had done with long telephone lines. Edison picked up sounds he felt were caused by "terrestrial magnetism" years before Marconi. Flammarion suggests the natural magnetism of the Earth might be harnessed to propagate sounds across space. (NB 1894: 'wireless' telegraphy is demonstrated by Sir Oliver Lodge)."*[83]

As NASA recently confirmed – eight years after *Les Terres du Ciel*'s publication – Camille Flammarion's Martian *chef-d'œuvre* still drives in between didactics and speculation, in between an academic authority and popularization, in between science and a 'technological aesthetic'. In that aesthetics point, for instance, the Astronomer's sense of a science 'open to all' should also be further reviewed alongside those names already mentioned: such as Paul Fouché and Keplen that should be better revisited together with Flammarion's connection with contemporary artists of his, such as Loïe Fuller and Maurice Chabas[84].

However, tracking the path that my *voyage* has followed until now, NASA's tab is relevant here as another form of *technological ekphrasis*. The 'telegraphic' used by Flammarion in 1892 is primordial, not only because it served that desired interplanetary communication, but also

[83]Nasa, Stable URL: http://www.nasa.gov/audience/forstudents/9-12/features/F_Mars_Chronology.html (25/08/2016)

[84]Pierre, Arnauld, *Maternités Cosmiques, La Recherche des origines, de Kupka à Kubrick,* Paris: Éditions Hazan, 2010, pp. 112-114

(and again) because in this 1892's 'book to come' a temporal interface is established with the year of 1884, the year of *Les Terres du Ciel.*

Remembering, for the last time, the meta-figure of Camille Flammarion in the Observatory [**fig. 6**]: that is also his Observatory 'to come'. In 1883, the astronomer had indeed become the owner of the site in Juvisy-sur-Orge, the suburban area of Paris, but the Observatory was only to be inaugurated later in 1887 [**fig. 35**]. In one hand, that first representation of Camille Flammarion still places him in an imaginary higher-top sight: as a godlike figure, he is presenting a 'view-point' to become. On the other, he is already advertising that masterpiece also to come: *La planète Mars et ses conditions d'habitabilité* (1892), where he will present the majority of his Juvisy-sur-Orge's 'telescopic views'.

Again, in 1884, the French Astronomer was 'gazing' at his future. However, that future was also gazing back. In the 1909's edition of his '*La planète Mars et ses conditions d'habitabilité'*, the page No. 433 gives an important representation: Camille Flammarion's 'New Martian globe, published in the year of 1898 [**fig. 36**]. Thus, preceding the figure the French Astronomer detailed explains:

"*Le globe de 1884 mesurait Om, 35 de circonférence. Celui de 1898 mesure Om, 47."*[85]

In his near future – in 1909 – Camille Flammarion, even if still exposing his first globe's incompleteness, can assure again that the present of the reader is that of looking back on time, looking back on *Les Terres du Ciel*'s time. Also, in 1884, the Astronomer secured the memory of his *Les Terres du Ciel*'s first edition's. In fact, Flammarion's writing production is cosmic

[85]Flammarion, Camille, *La planète Mars et ses conditions d'habitabilité, synthèse générale de toutes les observations : climatologie, météorologie, aréographie, continents, mers et rivages, eaux et neiges, saisons, variations observées... par Camille Flammarion*, Paris: Gauthier-Villars, 1892-1909, vol. 2, p. 443

itself: every book is a nebular star preserving its originality while travelling through the universe of time.

Nonetheless, in between *Les Terres du ciel, description astronomique, physique, climatologique, géographique des planètes qui gravitent avec la terre autour du soleil et de l'état probable de la vie à leur surface* (1877) and *Les Terres du ciel, Voyage Astronomique sur les Autres Mondes et Description Des Conditions Actuelles de la Vie sur les Diverses Planètes du Système Solaire* (1884) a new main path was taken: Mars is now presented as frontispiece, as the first *Livre* and as the closest *terre* gazing our *terre*. In the end, the new *Les Terres du Ciel'*s only trope is that in which the Martian altitude was never really wanted, but only served the Icarus' desire to see himself in the mirror.

(Word count: 13 411)

ILLUSTRATIONS

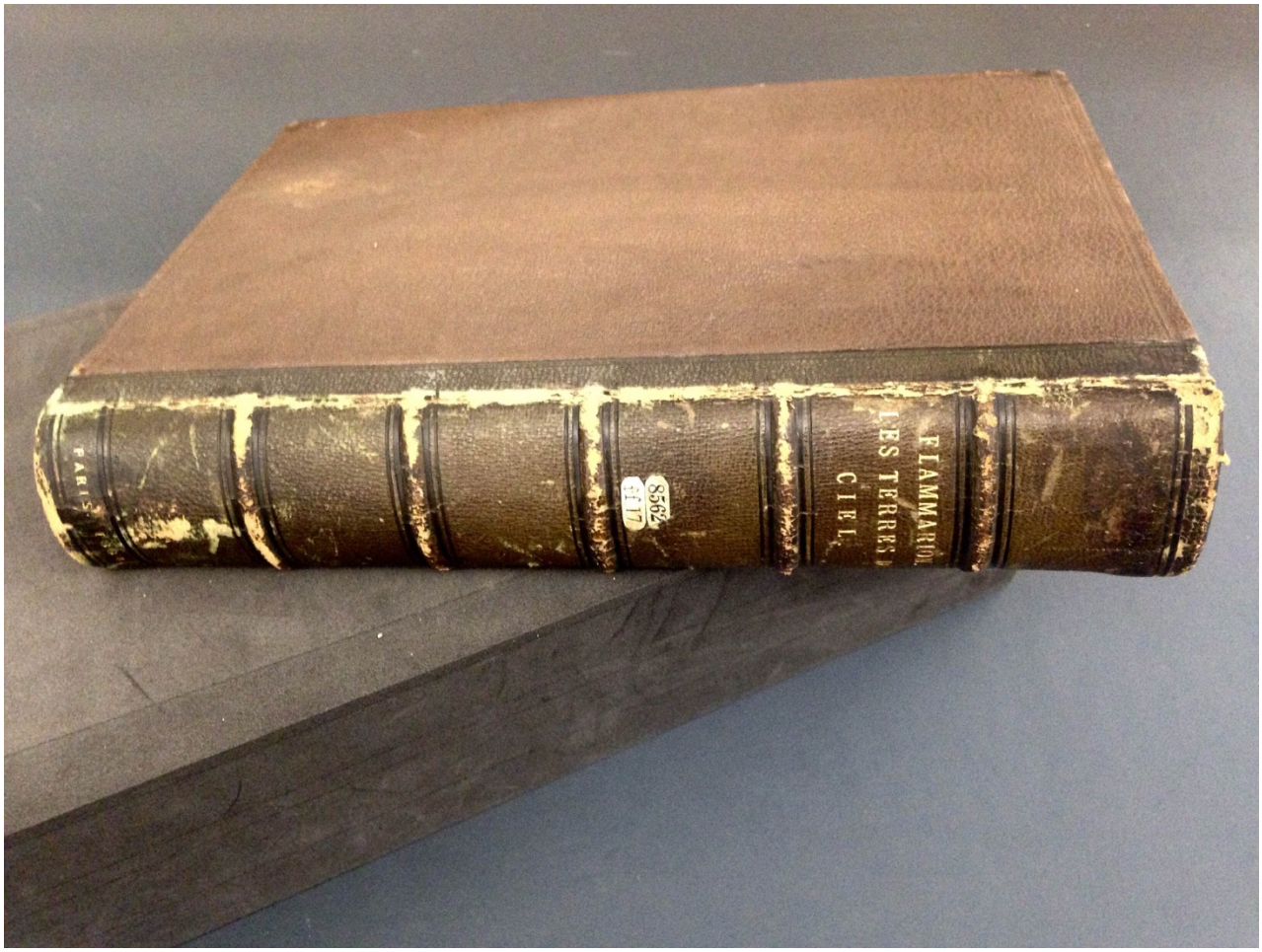

Figure 1: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884

(Book Cover)

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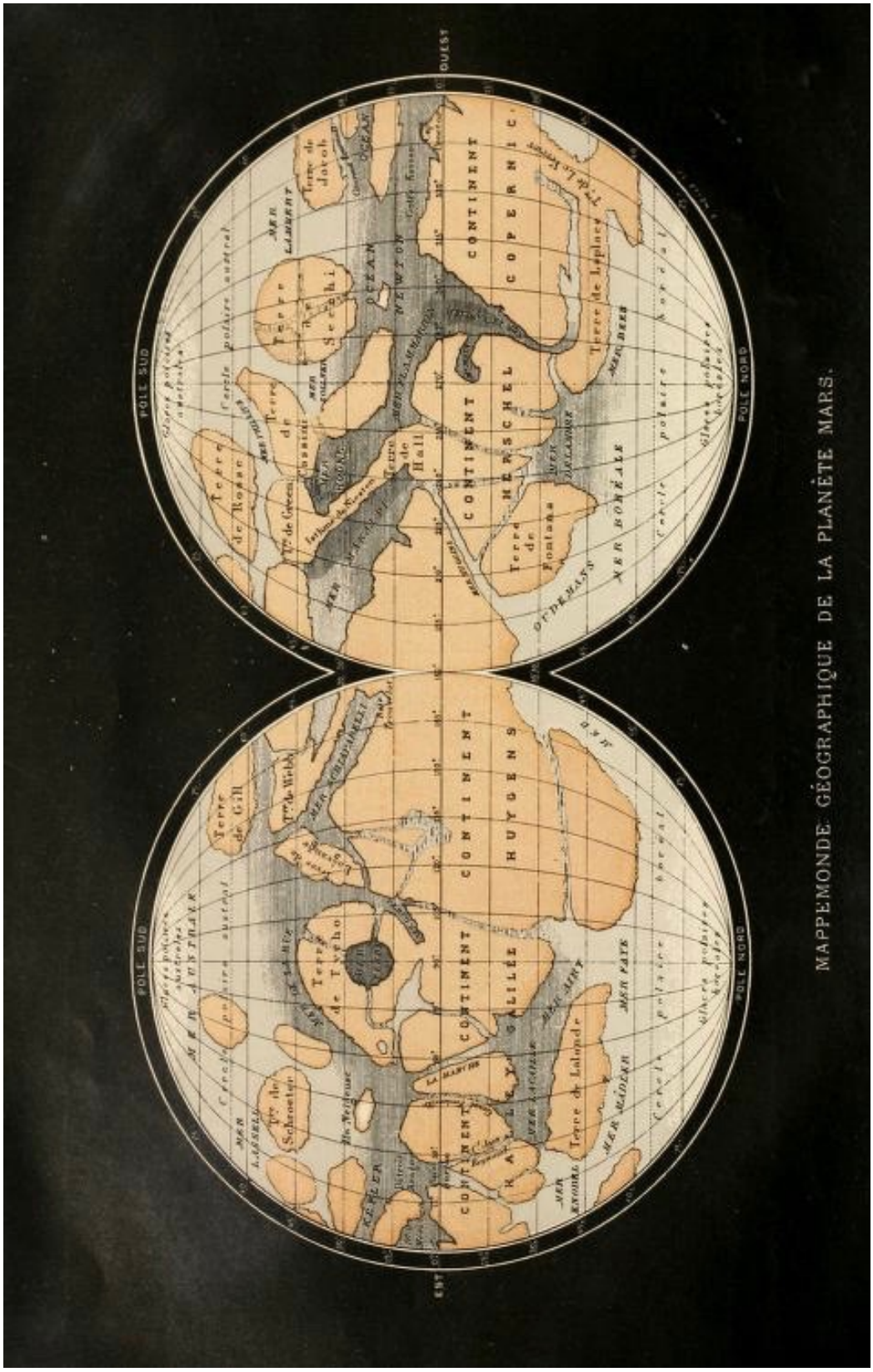

Figure 2: Camille Flammarion, *Mappemonde Géographique de la Planète Mars,* 1884

In *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire*, Paris: C. Marpon et E. Flammarion (Frontispiece)

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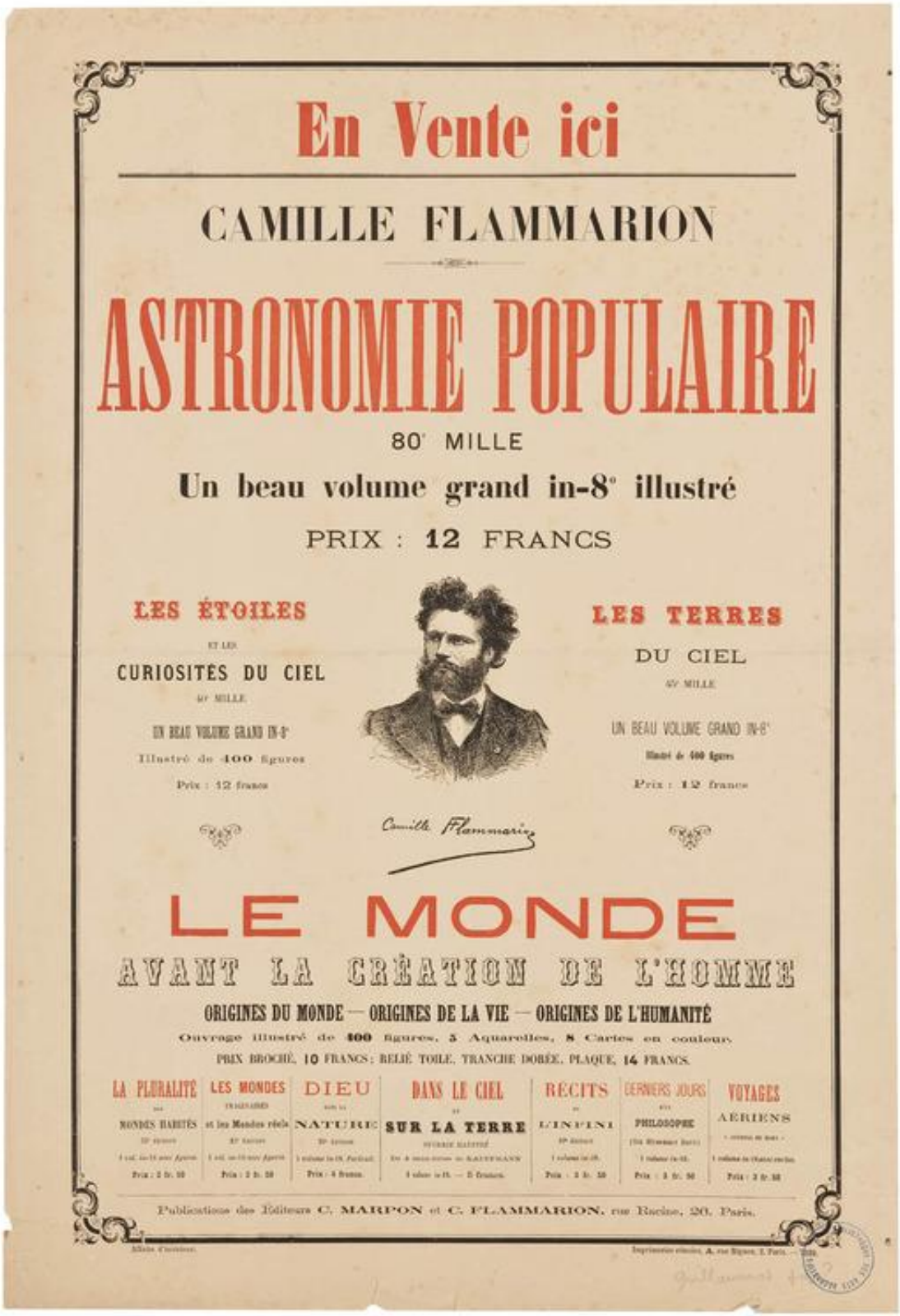

***Figure 3**:* Unknown, *Camille Flammarion's Astronomie Populaire,* 1881

Poster, 56,5 x 38,5 cm

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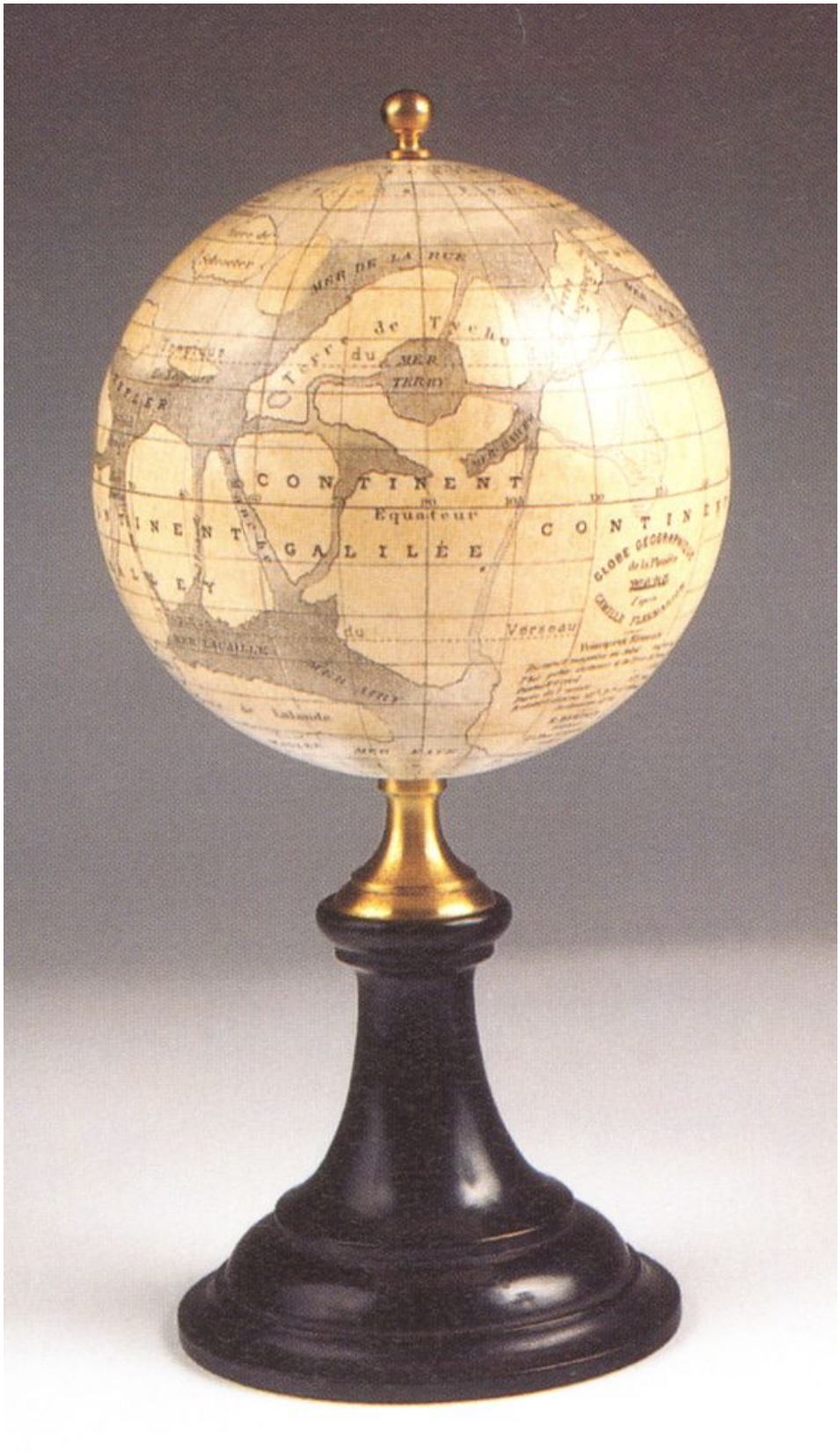

Figure 4: Camille Flammarion, *Globe Géographique de la Planète Mars,*1884

Globe on wooden base, 23 x 17 cm

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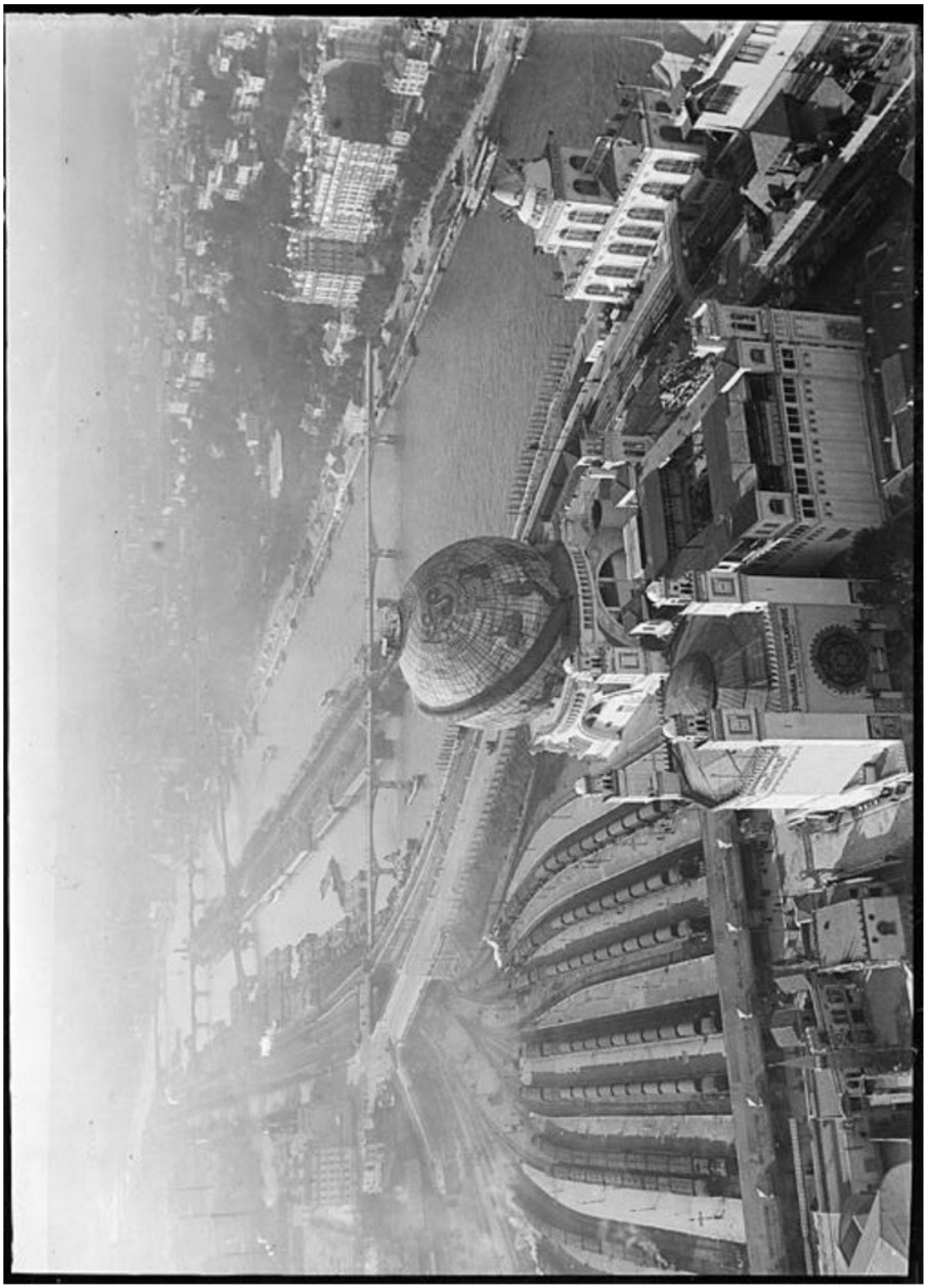

Figure 5: Lucien Roy (architect), *Globe celeste, Vue aérienne sur l'ensemble de l'exposition*, *Paris, Exposition Universelle de 1900,* 1990

B&w photograph (gelatin-bromide)

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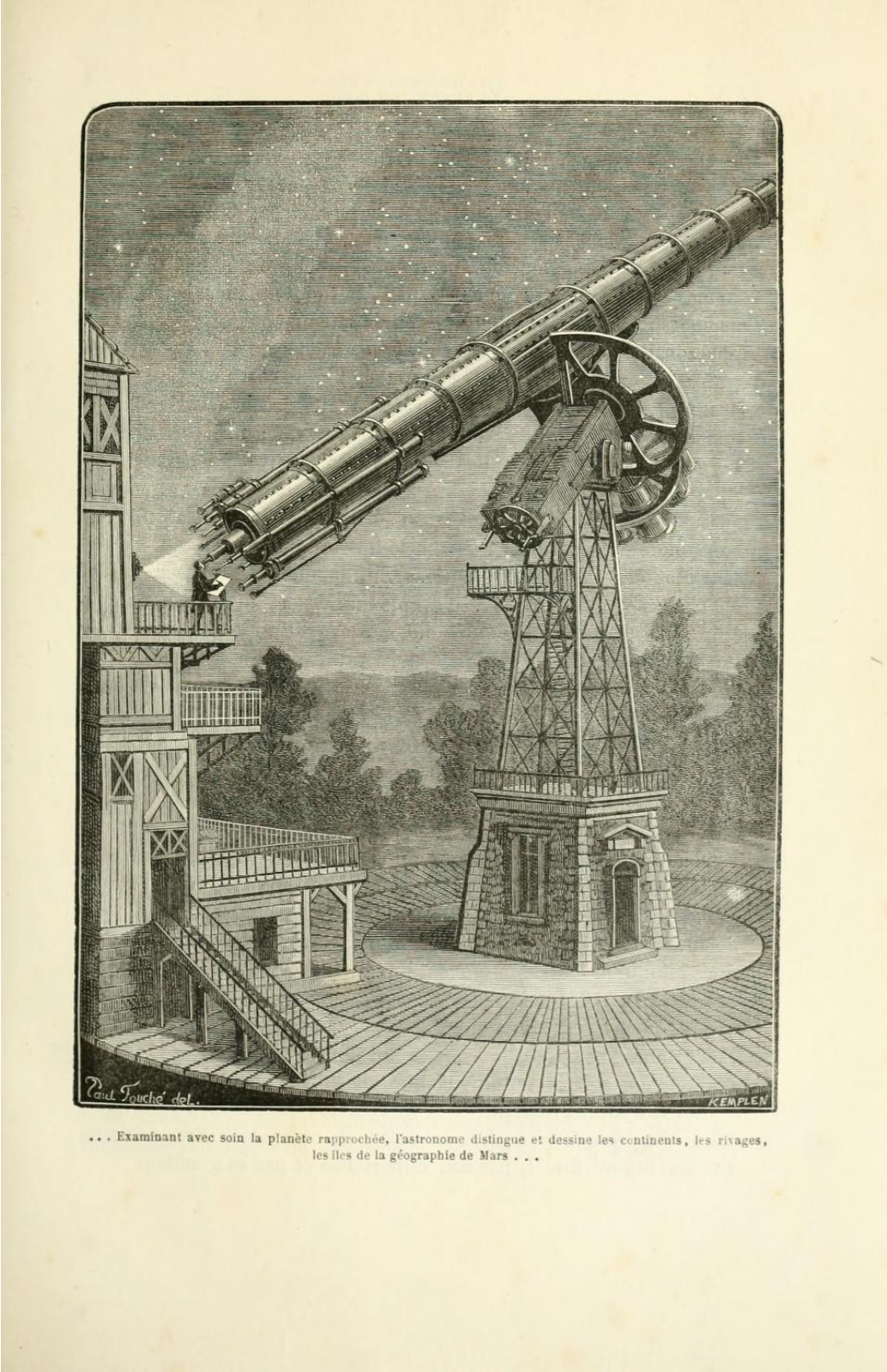

Figure 6: Camille Flammarion*, Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 5)

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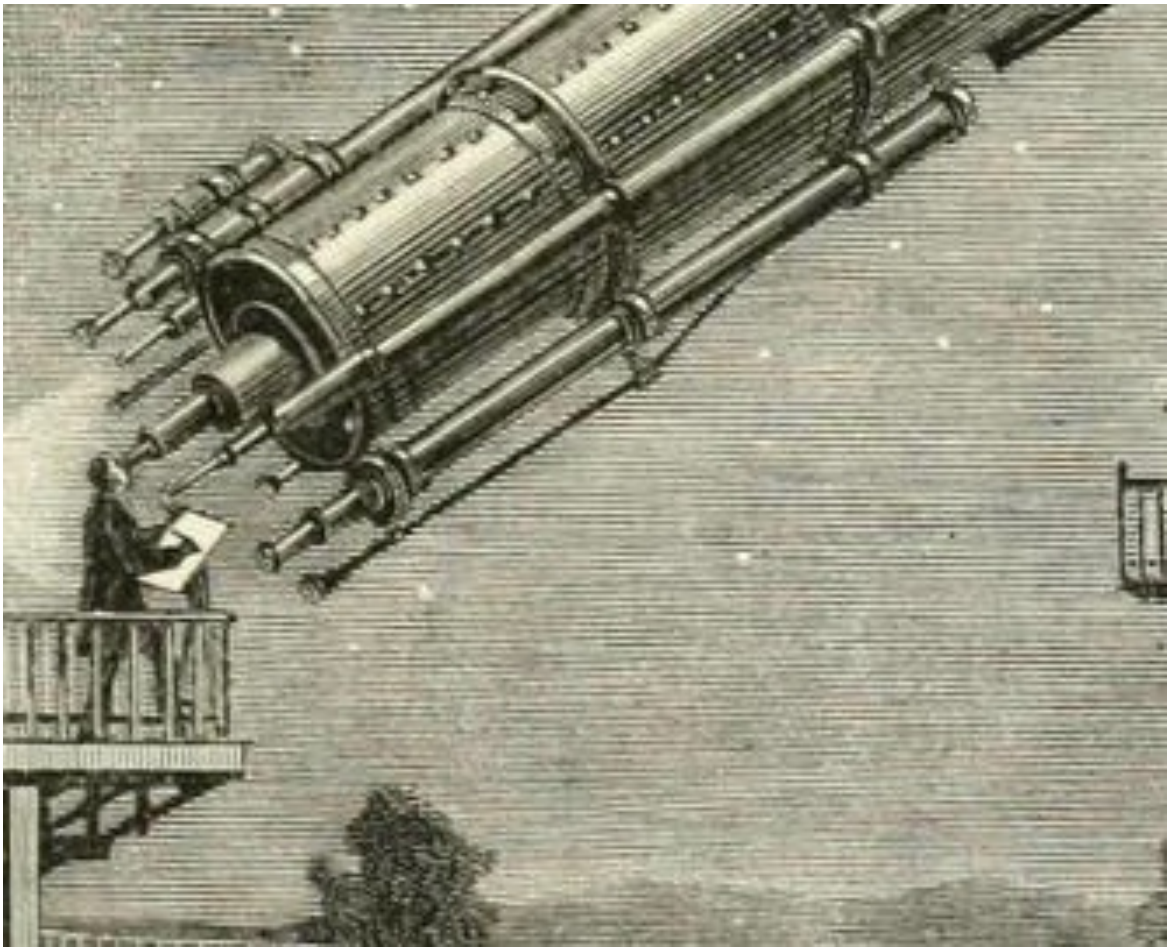

Figure 7: Camille Flammarion*, Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 5)

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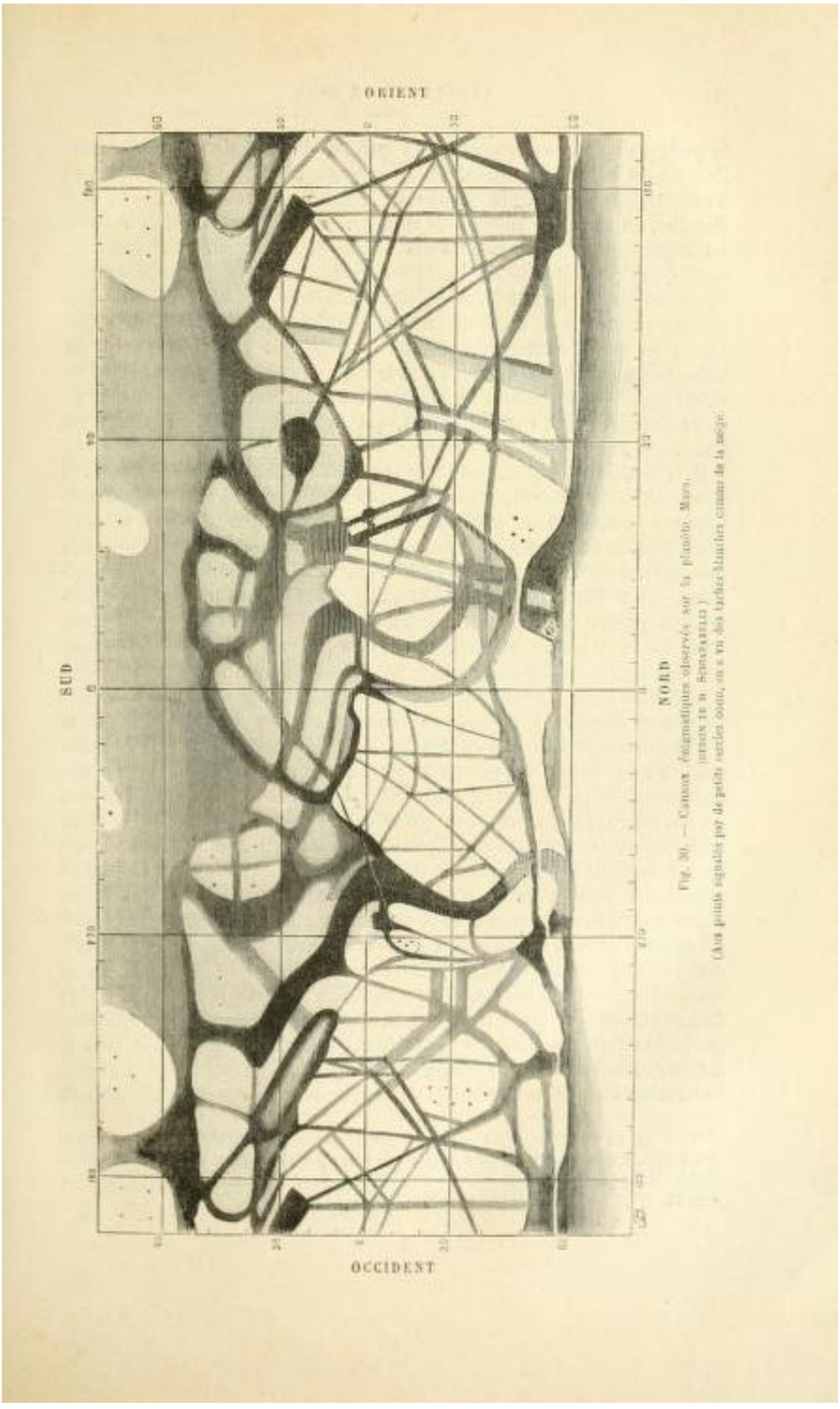

Figure 8: Camille Flammarion*, Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p.61)

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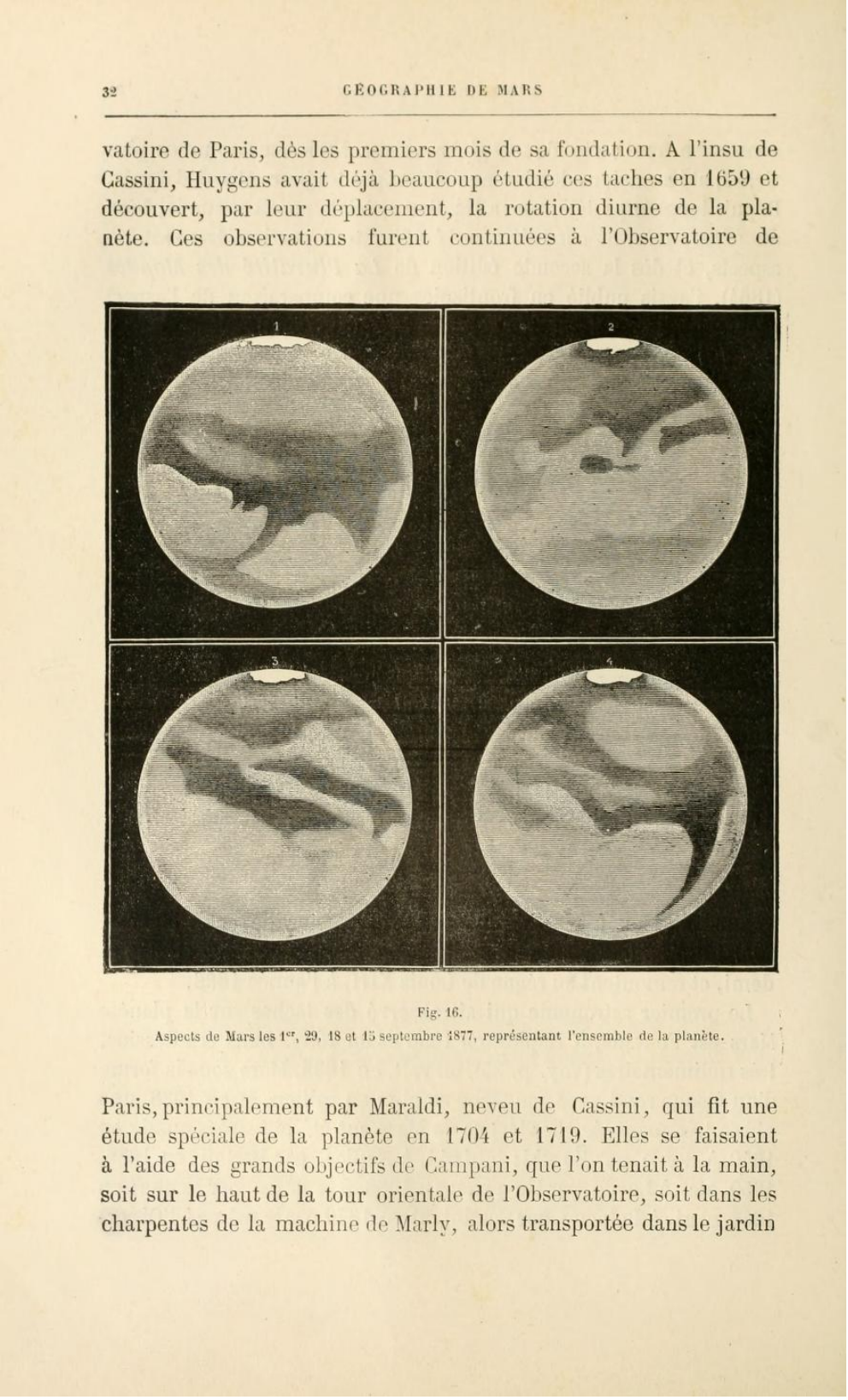

32 GÉOGRAPHIE DE MARS

vatoire de Paris, dès les premiers mois de sa fondation. A l'insu de Cassini, Huygens avait déjà beaucoup étudié ces taches en 1659 et découvert, par leur déplacement, la rotation diurne de la planète. Ces observations furent continuées à l'Observatoire de

Fig. 16.
Aspects de Mars les 1er, 29, 18 et 15 septembre 1877, représentant l'ensemble de la planète.

Paris, principalement par Maraldi, neveu de Cassini, qui fit une étude spéciale de la planète en 1704 et 1719. Elles se faisaient à l'aide des grands objectifs de Campani, que l'on tenait à la main, soit sur le haut de la tour orientale de l'Observatoire, soit dans les charpentes de la machine de Marly, alors transportée dans le jardin

Figure 9: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p.32)

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Pendant l'opposition (¹) de 1858, le P. Secchi a fait à Rome, en des conditions éminemment favorables aussi, un grand nombre de dessins dont nous reproduisons huit fac-simile, sur nos fig. 67 et 68. Les quatre de la figure 12 sont des 5, 6, 7 et 10 juin. Les neiges polaires y sont bien marquées; la mer qui entoure le pôle supérieur y est nettement visible, ainsi que la Manche qui en descend et que les continents qui s'étendent à l'est et à l'ouest. Les dessins de la fig. 13 sont des 13, 14, 17 et 18 juin; ils présentent d'autres mers et d'autres continents. Remarquons surtout, sur les deux supérieures, la mer foncée qui descend en s'amincissant et finit

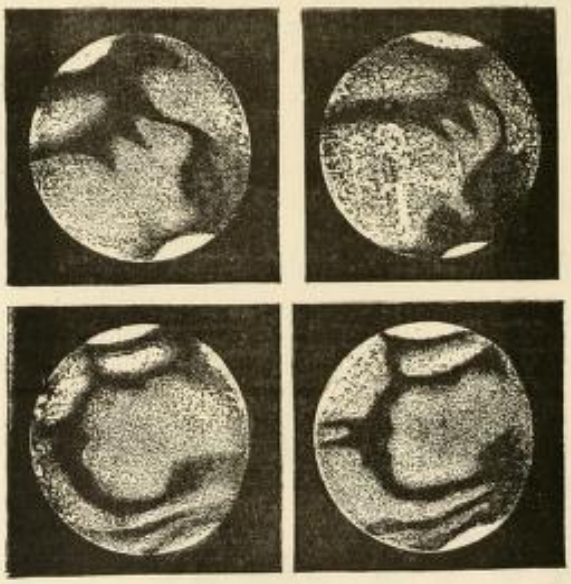

Fig. 12. — Aspects de Mars les 5, 6, 7 et 10 juin 1858.

par une bifurcation dirigée vers l'est : l'astronome romain l'avait appellée l'*Atlantique* de Mars.

Nous avons également reproduit les importants dessins faits en 1862 et 1864 par Kaiser, directeur de l'Observatoire de Leyde. Notre figure 14 représente ses vues télescopiques des 31 octobre, 23 novembre, 10 et

(¹) Une planète est dite en *opposition* avec la Terre lorsqu'elle passe derrière nous relativement au Soleil, la Terre se trouvant entre elle et le Soleil, et la planète étant par conséquent ainsi diamétralement opposée au Soleil. Il est clair que cette situation est la plus favorable pour nos observations. — Se souvenir de la signification de ce terme, car il sera souvent employé dans les pages suivantes.

Figure 10: Camille Flammarion*, Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 28)

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ont qu'un petit de cinq jours, produit par la combinaison du mouvement du satellite extérieur avec la rotation de la planète. Ce petit mois minuscule leur sert sans doute de semaine, et peut-être ont-ils aussi donné à ces jours des noms dérivés des cinq astres qu'ils voient le mieux : le Soleil, leurs deux lunes, Jupiter et la Terre.

La durée de la rotation diurne de Mars est connue avec autant de précision que celle de notre propre monde. Elle a été déterminée dès l'an 1659 par Huygens. Aux époques de bonne visibilité, une observation attentive de quelques heures suffit pour permettre de

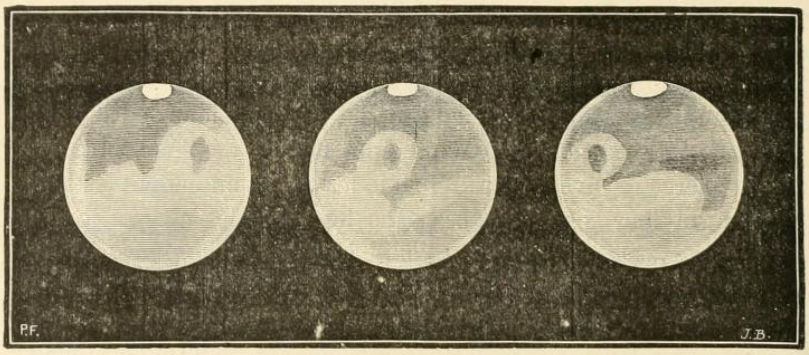

Fig. 49. — Comment on observe la rotation diurne de Mars.

constater cette rotation par le déplacement des taches, et, en quelques jours, si l'on a remarqué une tache bien définie, on peut la voir revenir par le méridien central du disque et ainsi faire soi-même une première constatation approximative de la durée de la période. Ainsi, par exemple, voici trois dessins faits le même soir (28 septembre 1877), le premier à 7 heures 30 minutes du soir, le second à 9 heures 30 minutes, le troisième à 11 heures 30 minutes : ils suffisent pour montrer que la tache circulaire grise a marché de la droite vers la gauche (pôle sud en haut), et qu'en quatre heures elle a parcouru, en apparence, plus de la moitié de l'hémisphère. Comme les bords d'un globe sont vus en raccourci, elle emploie beaucoup plus de temps pour parcourir le premier et le dernier quart. En fait on constate que pour aller d'un bord à l'autre, elle met plus de douze heures, c'est-à-dire plus de vingt-quatre pour faire le tour complet.

Figure 11: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 100)

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moment où elles arrivaient au bord de l'hémisphère éclairé, c'est-à-dire sur la ligne de séparation de la partie éclairée avec la partie obscure de la planète. En ces conditions, ces taches blanches ont été vues comme des bosses, aspérités, et ainsi elles ont montré qu'elles sont en réalité plus élevées que le niveau moyen de la surface de la planète. D'autre part, des sinuosités, des abaissements dans le cercle terminateur correspondant aux larges taches sombres, indiquent clairement aussi la dépression de ces taches au-dessous du niveau général. C'est là une observation que l'on peut

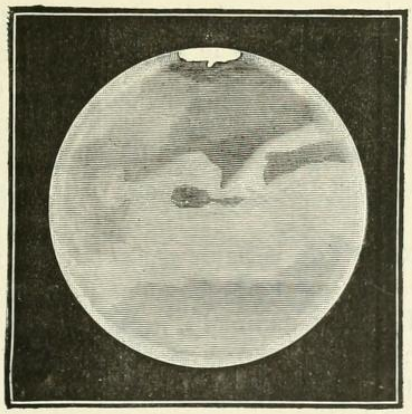

Fig. 66. — Aspect de Mars le 29 septembre 1877 à 9 heures du soir.

faire presque tous les soirs sur la Lune, que l'on a obtenu également pour Vénus et Mercure, mais qui n'avait pas encore été faite sur la planète Mars. D'après ces observations, les plateaux montagneux les plus élevés de la planète seraient situés entre le 60e et le 70e degré de latitude australe, vers l'extrémité occidentale de la Terre de Gill. « La chaine de montagnes qui forme presque complètement cette terre, dit l'astronome cité plus haut, est si élevée en certains points que le cercle terminateur en est tout bouleversé et que le bord même de la planète en est modifié. Il y a là un sommet si blanc, si brillant, qu'il a été pris pour la tache polaire par plusieurs observateurs, comme on peut s'en rendre compte par la position erronée qu'ils ont assignée à cette tache sur leurs dessins. Cette région alpestre est située entre le 180e et le 190e degré de longitude. »

Figure 12: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 141)

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***Figure 13**:* Unknown, *Folies Rambuteau, L'année Electrique revue*, ca. 1880-1890

Poster, 55,7 x 44,2 cm

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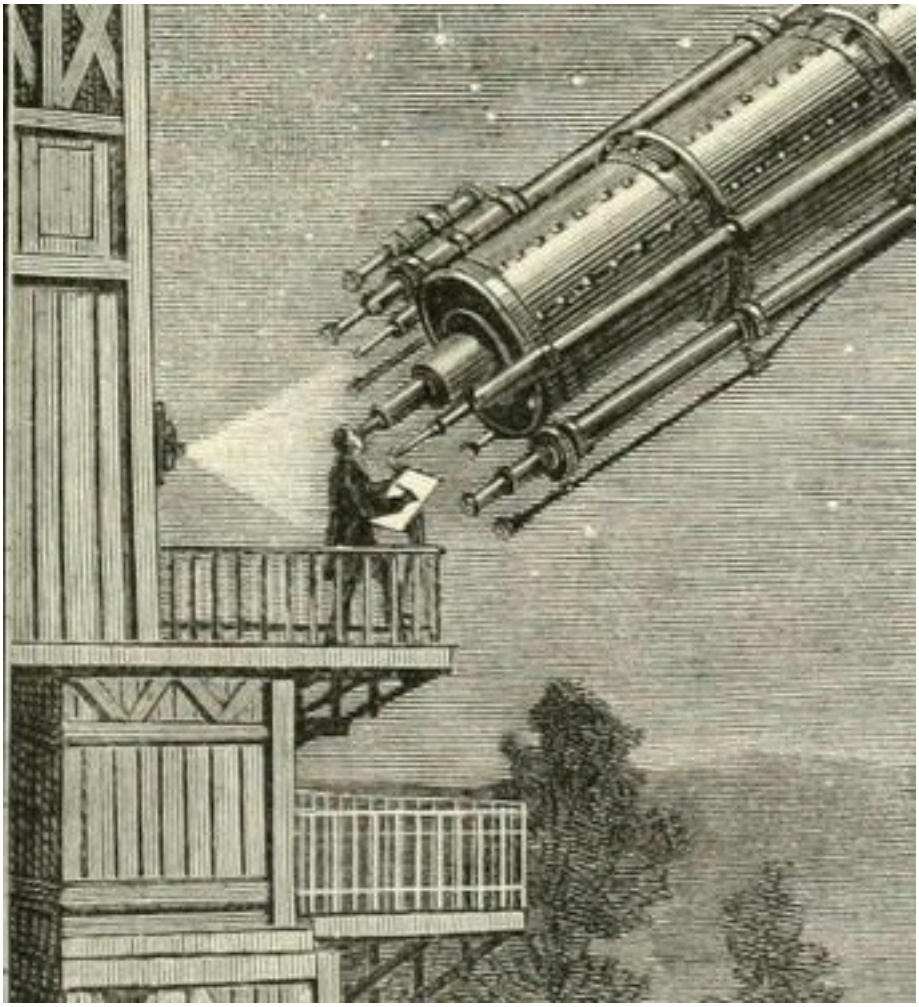

Figure 14: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 5)

(detail)

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dans l'espace la lumière qu'elles reçoivent du Soleil, et qu'en faisant arriver leur lumière sur un prisme placé devant l'oculaire d'une lunette, cette lumière donne naissance à un petit spectre coloré des sept couleurs de l'arc-en-ciel, et qui est l'image parfaite du spectre solaire. D'autre part, si l'on examine le Soleil lorsqu'il n'est pas très élevé au-dessus de l'horizon, avant son coucher, par exemple, on remarque qu'il présente non seulement les lignes caractéristiques des éléments qui brûlent dans cet astre, mais encore d'autres lignes, qui sont d'autant plus noires et plus épaisses, que l'astre est plus bas. Ces lignes-là sont produites par l'atmosphère terrestre, et surtout par la vapeur d'eau dont cette atmosphère est constamment imprégnée.

On se rendra compte de ce fait à l'examen de notre figure 60, qui

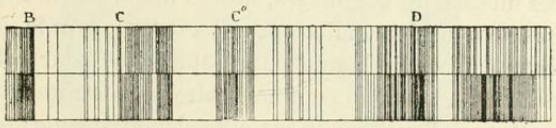

Fig. 60. — Raies atmosphériques du spectre solaire que l'on retrouve dans le spectre de Mars.

représente les raies principales du spectre solaire et, au-dessous, leur épaississement et leur multiplication par l'absorption, dans ce spectre due à la vapeur d'eau, lorsqu'on l'observe quelque temps avant le coucher du soleil. Eh bien, cette dernière figure est analogue à celle du spectre de Mars, lors même qu'on l'observe à une très grande hauteur au-dessus de l'horizon, et dans des conditions telles que notre propre atmosphère ne peut pas modifier sensiblement sa lumière.

Certes, c'est là un résultat qui peut paraître tout à fait incroyable aux personnes qui ne se tiennent pas au courant du progrès des sciences. Il est merveilleux, en effet, que nous soyons aussi sûrs de l'existence de l'eau dans cette planète, que si un messager céleste avait pu nous en apporter un tonneau à l'état liquide ou un morceau à l'état de glace, et, à franchement parler, ces procédés de l'analyse spectrale sont de ceux qui mettent le mieux en lumière la puissance conquérante du génie de l'homme. Lorsque nous savons qu'une étendue de glace de la dimension de la France, n'est guère

Figure 15: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 127)

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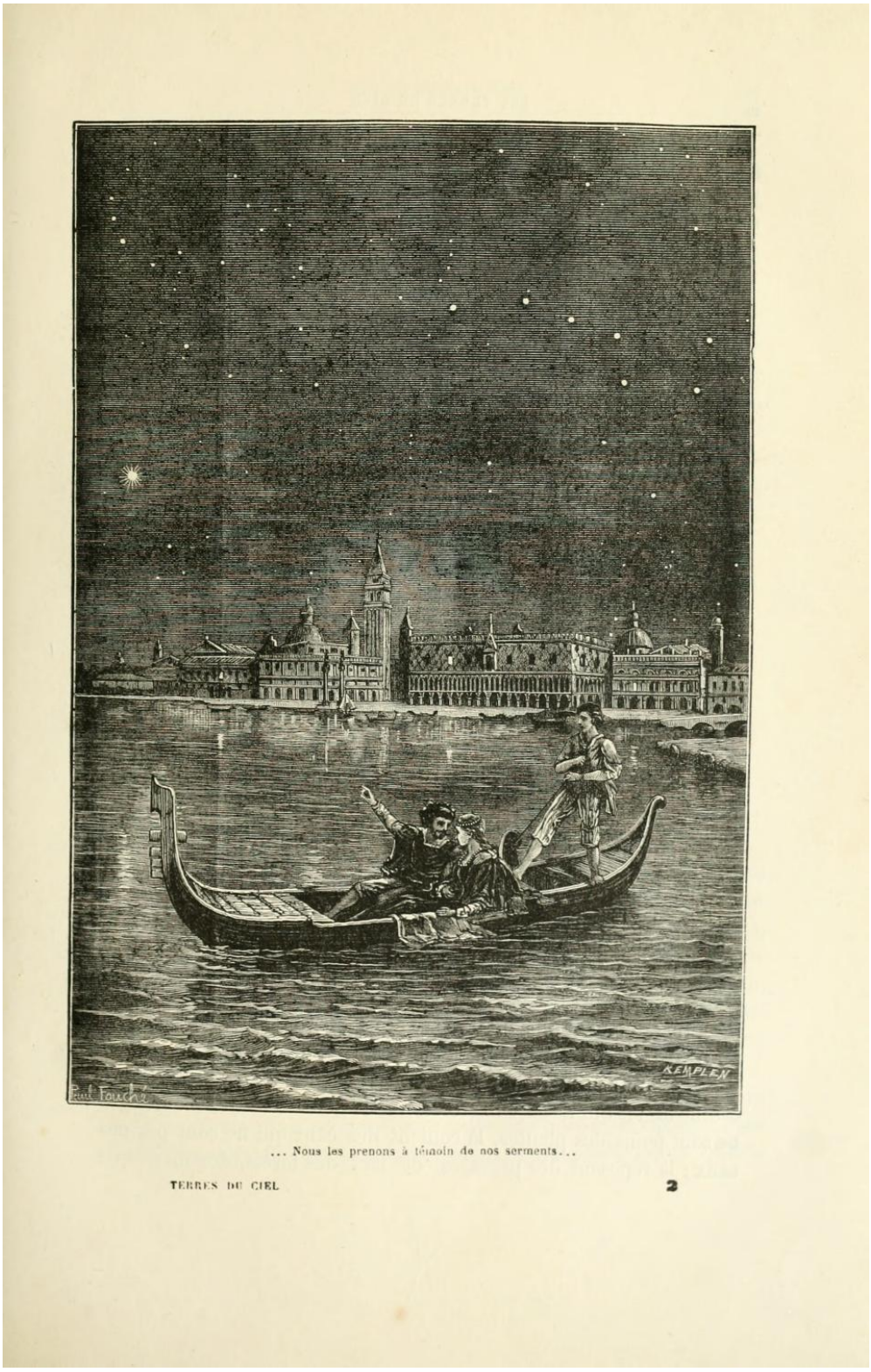

Figure 16: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 9)

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Figure 17: *Tableau présentant des manuscrits et dessins obtenus avec le télégraphe autographique dit pantélégraphe de Caselli,* 1861

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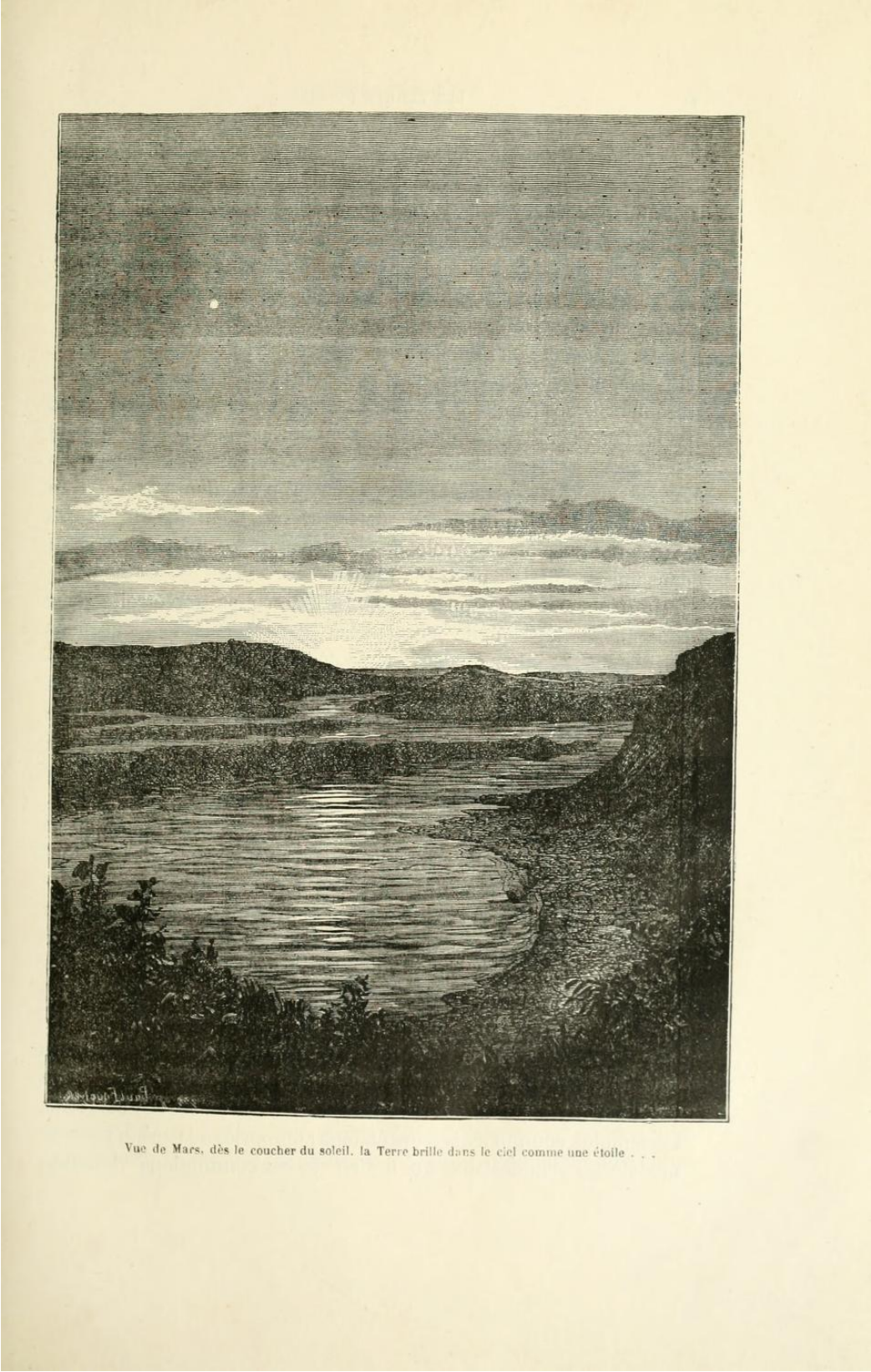

Vue de Mars, dès le coucher du soleil. la Terre brille dans le ciel comme une étoile . . .

Figure 18: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 13)

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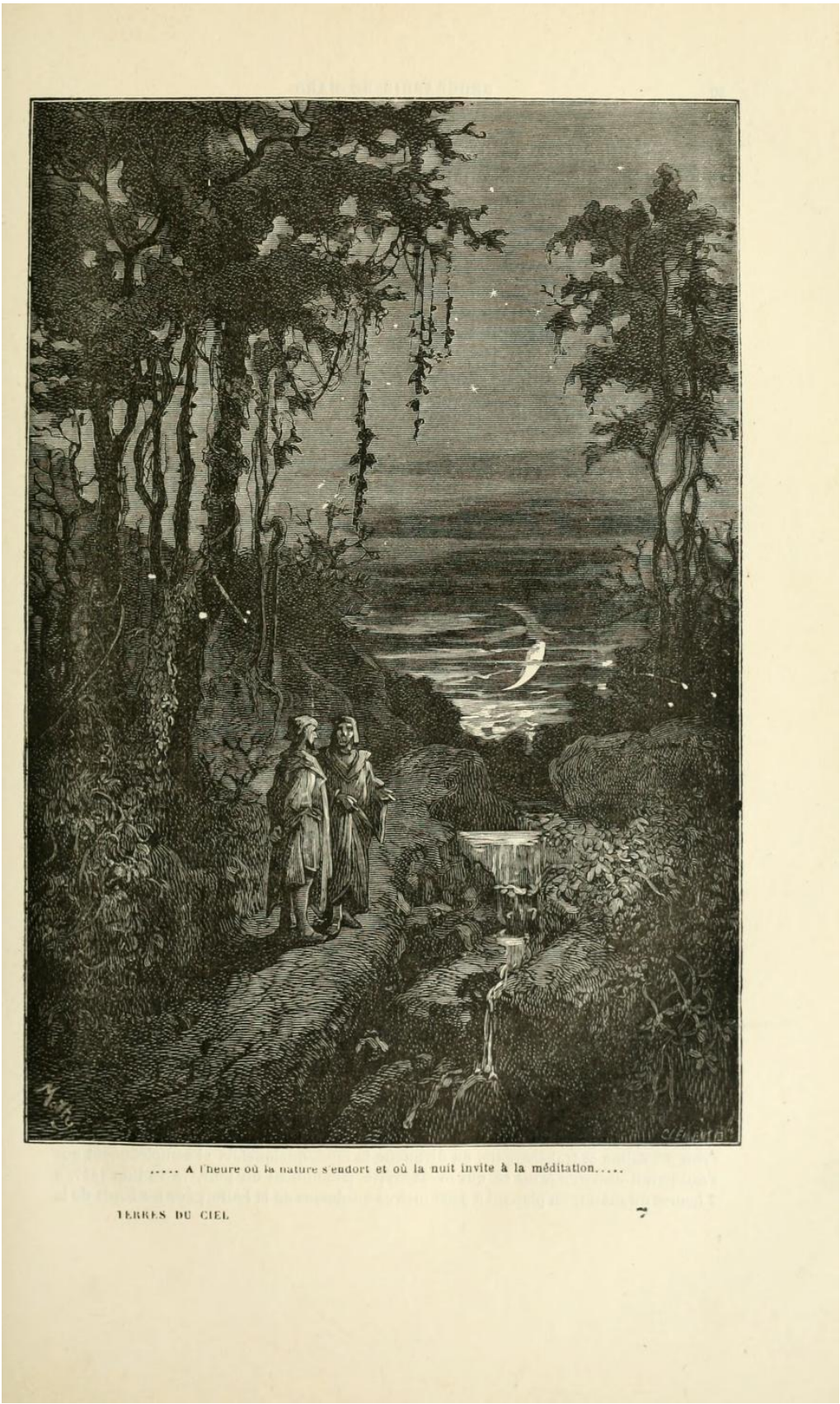

..... A l'heure où la nature s'endort et où la nuit invite à la méditation.....

TERRES DU CIEL 7

Figure 19: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 49)

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***Figure 20**:* Camille Flammarion*, Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 177)

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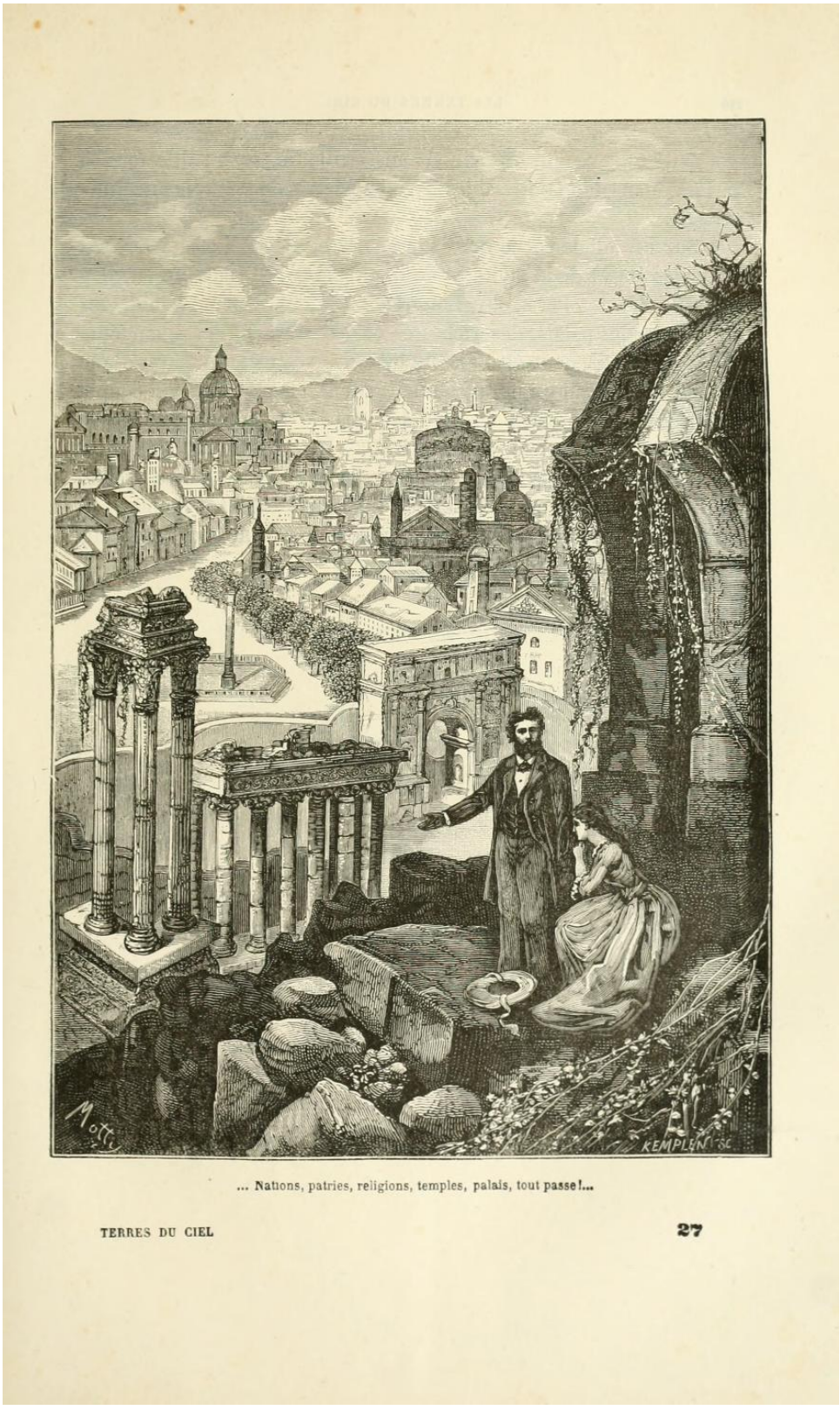

Figure 21: Camille Flammarion*, Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 209)

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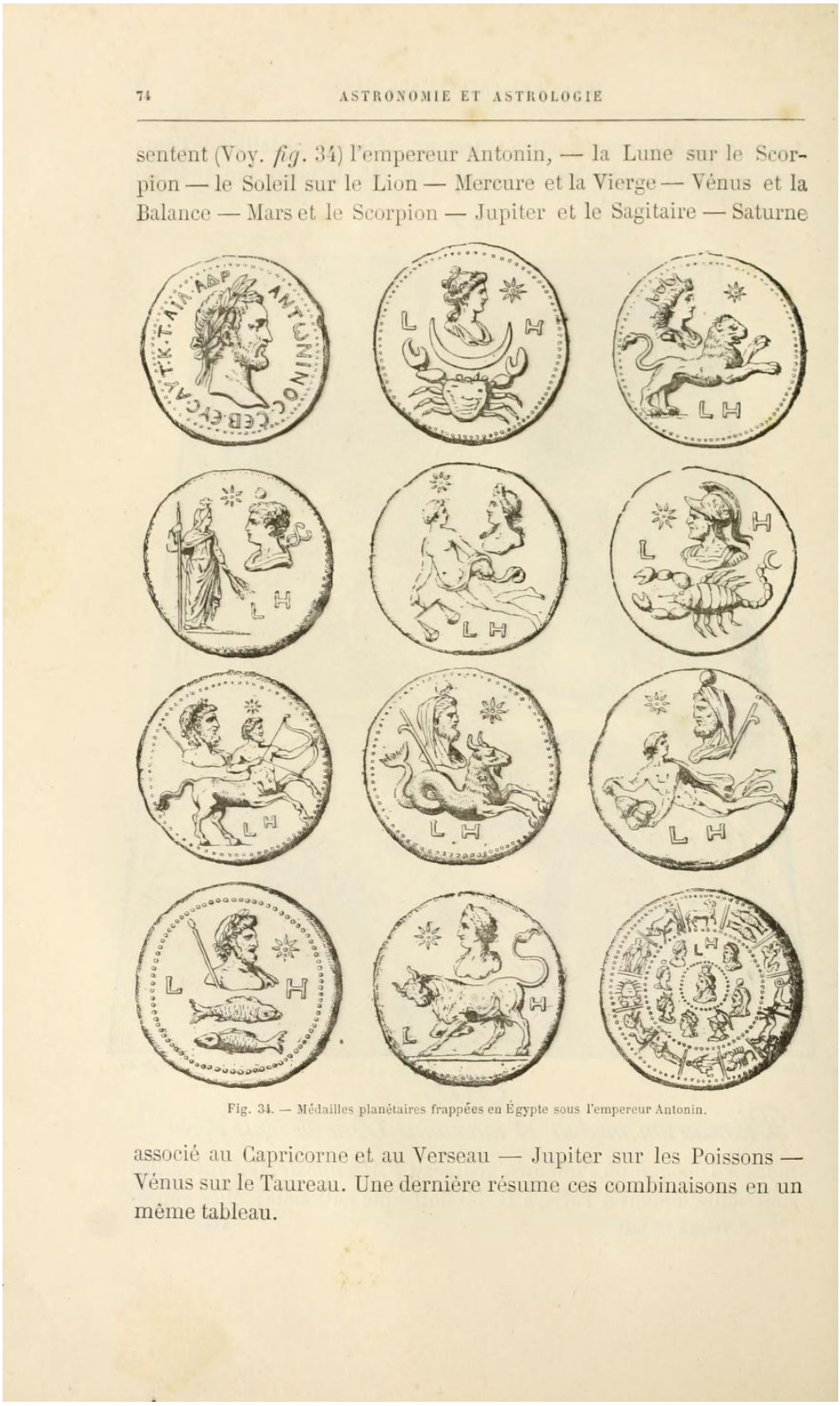

74 ASTRONOMIE ET ASTROLOGIE

sentent (Voy. *fig.* 34) l'empereur Antonin, — la Lune sur le Scorpion — le Soleil sur le Lion — Mercure et la Vierge — Vénus et la Balance — Mars et le Scorpion — Jupiter et le Sagitaire — Saturne

Fig. 34. — Médailles planétaires frappées en Égypte sous l'empereur Antonin.

associé au Capricorne et au Verseau — Jupiter sur les Poissons — Vénus sur le Taureau. Une dernière résume ces combinaisons en un même tableau.

***Figure 22**: Camille Flammarion, Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 74)

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A cette époque, en Égypte, l'astrologie faisait partie intégrante de la religion. Nous aurons lieu, plus tard, de revenir sur cet intéressant sujet historique.

Florissante aux premiers siècles de notre ère, l'astrologie était encore en grande faveur à la cour de France sous les Médicis, et même sous Louis XIV, Cassini y croyait encore. A la naissance du

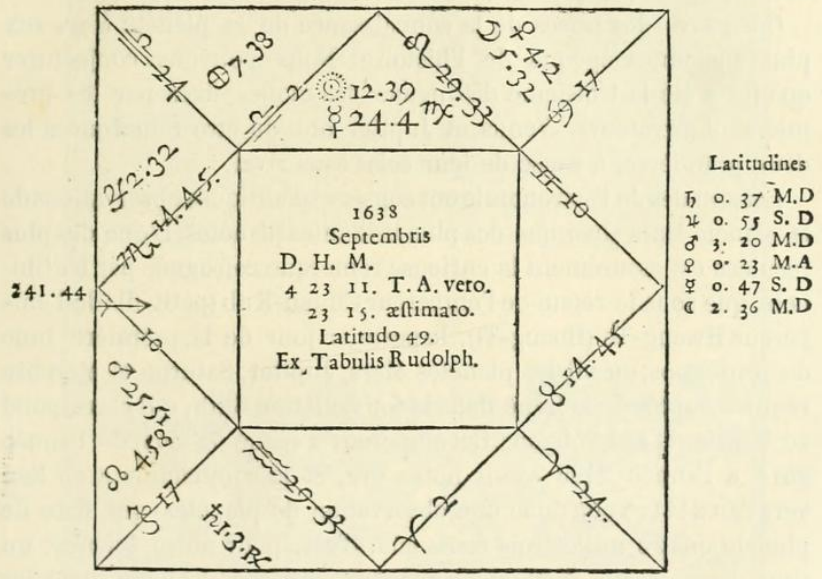

Fig. 35. — Horoscope de Louis XIV tiré le jour de sa naissance.

roi, Anne d'Autriche avait fait venir l'astrologue Morin pour tirer l'horoscope du nouveau-né. Morin parait convaincu de sa science (1).

Il donne lui-même dans son livre l'horoscope du roi, reproduit ici, fait à Saint-Germain, le 4 septembre 1638, à 23^h15^m (c'est-à-dire le 5 à 11^h15^m) et raconte qu'il le remit au cardinal de Richelieu, que l'enfant a eu deux maladies, un érésipèle, le 12 mars 1644, et la

(1) J'ai de lui, dans ma bibliothèque, un énorme in-folio de 784 pages sur deux colonnes, tout entier consacré à l'Astrologie, bourré d'horoscopes de grands personnages, de villes et de provinces, et dédié à.... JÉSUS-CHRIST en personne : *Astrologia gallica*, La Haye, 1661. Pour l'auteur, la Terre est fixe au centre du monde et les astres régissent toutes les actions humaines. Morin était un médecin renommé. Il se basait sur les positions des planètes pour soigner ses malades, lesquels ne s'en portaient pas plus mal.

Figure 23: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 75)

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Figure 24*: Émile Raynaud,* Praxinoscope-Théâtre to show at the *Exposition Universelle* de Paris, 1878

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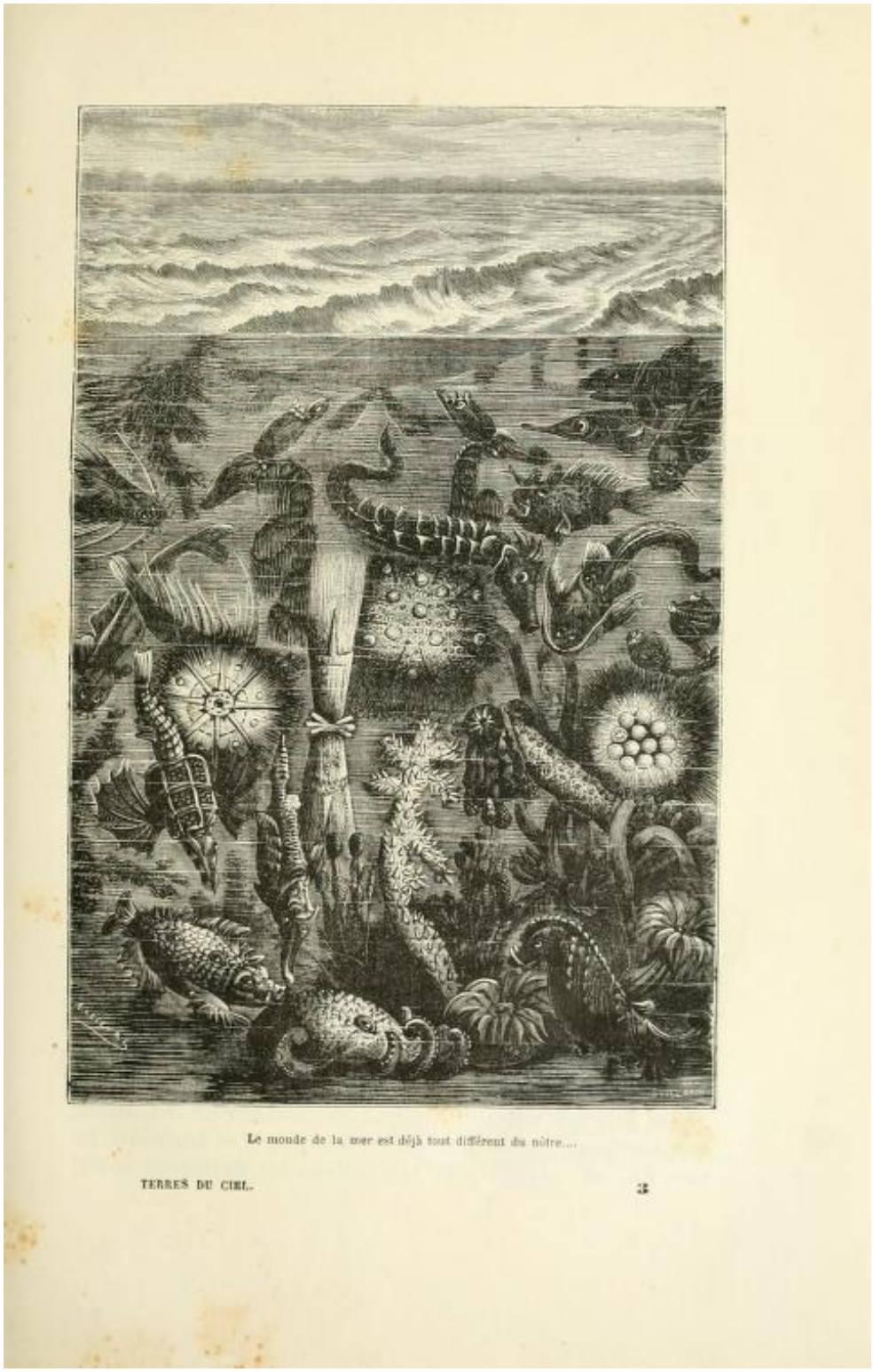

Figure 25: Camille Flammarion*, Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 17)

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casoar), mais elles ne leur servent plus, car ils ont perdu l'usage de voler. Les serpents boas et pythons portent encore à la partie postérieure de leur corps quelques pièces osseuses inutiles, reste des membres postérieurs qu'ils ont perdu, etc., etc.

Si nous voulions faire ici en détail l'analyse du corps humain, nous constaterions que l'anatomie confirme absolument la géologie et la paléontologie. Mais ce n'en est pas ici le lieu, quoique, en fait, nous ne sortions en aucune façon de la question posée : « Comment les habitants des autres mondes sont-ils construits? » et que nous établissions précisément par cette exposition les prémisses de sa

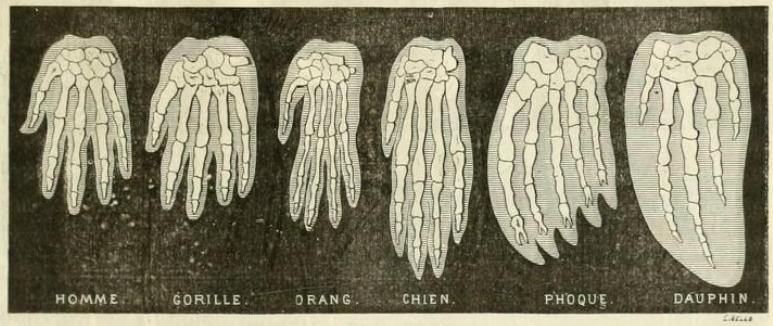

Fig. 88. — Les origines de l'homme : mains et pattes comparées.

solution scientifique. Signalons notre parenté avec toute la nature terrestre.

Comparons, par exemple, la main de l'homme avec les pattes du gorille, de l'orang-outang, du chien, du phoque, du dauphin. Sur notre figure 88, la partie blanche représente les os et la partie ombrée la chair. On voit que, anatomiquement, c'est *la même structure*.

La conclusion serait identiquement la même si nous comparions entre eux les squelettes tout entiers de l'orang, du chimpanzé, du gorille et de l'homme. L'homme s'élève graduellement (voy. *fig.* 89) de l'horizontalité de la nature animale vers la noblesse de la position verticale qui doit dominer le panorama du monde.

La comparaison des cerveaux conduit à la même conséquence. Le cerveau n'est que l'épanouissement de la moelle épinière : la partie

Figure 26: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 187)

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antérieure de la moelle épinière se développe d'espèce en espèce, devient le cerveau, lequel à son tour grandit, s'accroît et s'enrichit avec l'exercice des facultés intellectuelles.

On le voit, tous les faits d'observation s'accordent entre eux pour montrer que le type humain s'est lentement formé en passant par toute la série de la nature vivante; d'où il résulte qu'il n'est pas dû à la fantaisie ou à la volonté arbitraire d'un Créateur, qui l'aurait tiré du néant par un acte miraculeux étranger au développement nor-

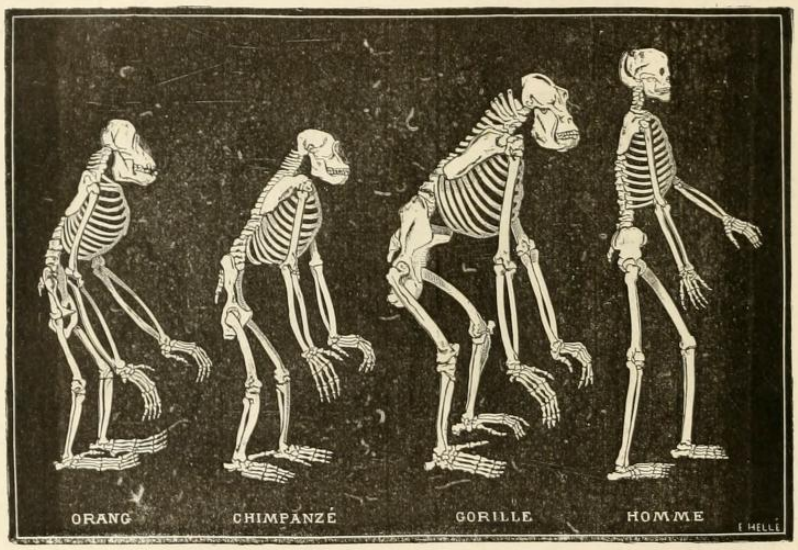

Fig. 89. — Les origines de l'homme : squelettes comparés.

mal de la nature terrestre, et que par conséquent ce type provient de la zoologie de notre planète aussi naturellement que le fruit produit par un arbre. Cette importante conclusion est encore surabondamment démontrée par une science étrangère aux précédentes, et qui, sans avoir rien de commun avec la géologie ou la paléontologie, vient cependant donner identiquement le même témoignage sur cette importante question de l'origine de l'homme. Nous voulons parler de l'embryogénie. En effet, chacun de nous a passé dans le sein de sa mère par les principales espèces animales qui existent encore aujourd'hui; chacun de nous a d'abord été une simple petite

Figure 27: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 188)

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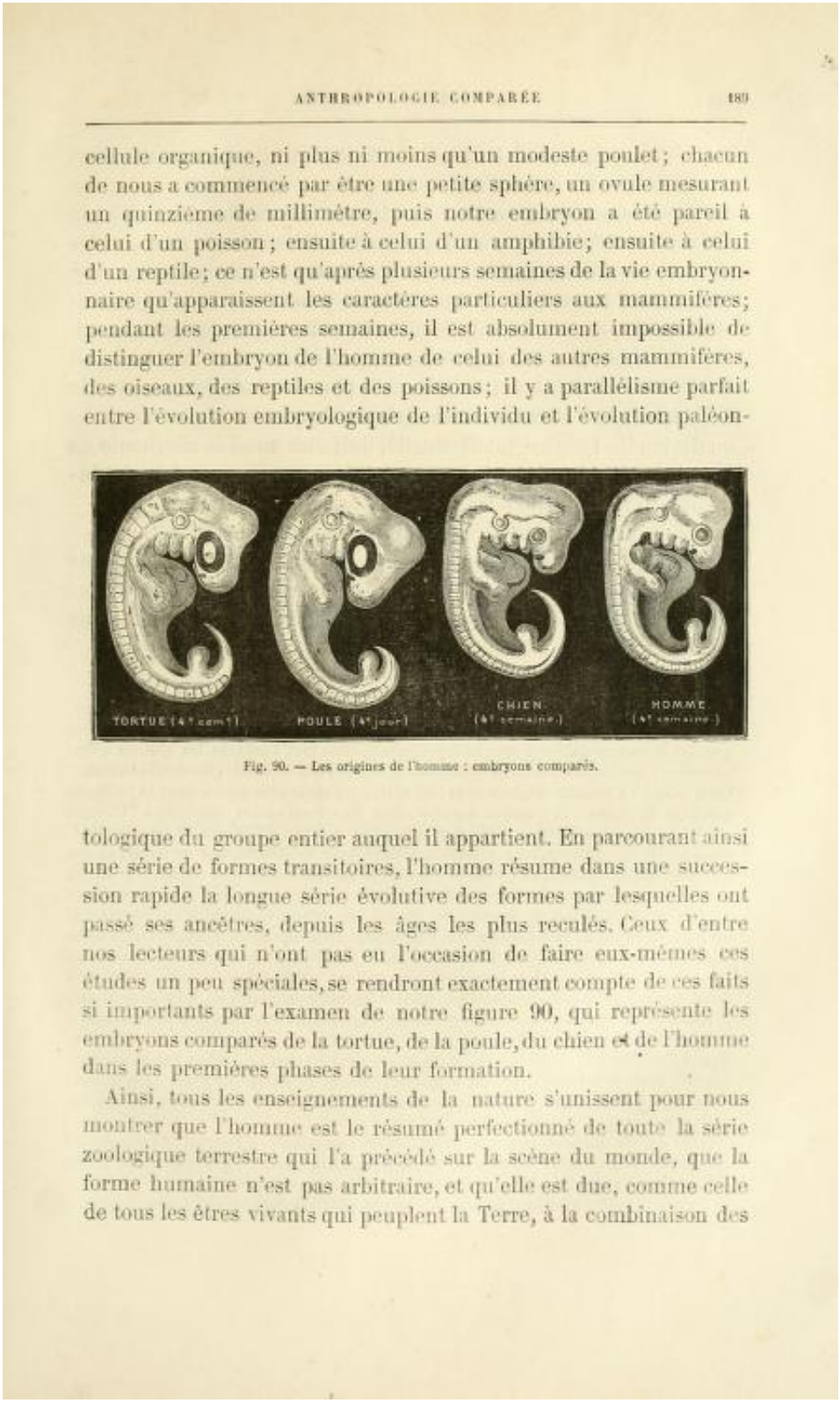

ANTHROPOLOGIE COMPARÉE 189

cellule organique, ni plus ni moins qu'un modeste poulet; chacun de nous a commencé par être une petite sphère, un ovule mesurant un quinzième de millimètre, puis notre embryon a été pareil à celui d'un poisson; ensuite à celui d'un amphibie; ensuite à celui d'un reptile; ce n'est qu'après plusieurs semaines de la vie embryonnaire qu'apparaissent les caractères particuliers aux mammifères; pendant les premières semaines, il est absolument impossible de distinguer l'embryon de l'homme de celui des autres mammifères, des oiseaux, des reptiles et des poissons; il y a parallélisme parfait entre l'évolution embryologique de l'individu et l'évolution paléon-

Fig. 90. — Les origines de l'homme : embryons comparés.

tologique du groupe entier auquel il appartient. En parcourant ainsi une série de formes transitoires, l'homme résume dans une succession rapide la longue série évolutive des formes par lesquelles ont passé ses ancêtres, depuis les âges les plus reculés. Ceux d'entre nos lecteurs qui n'ont pas eu l'occasion de faire eux-mêmes ces études un peu spéciales, se rendront exactement compte de ces faits si importants par l'examen de notre figure 90, qui représente les embryons comparés de la tortue, de la poule, du chien et de l'homme dans les premières phases de leur formation.

Ainsi, tous les enseignements de la nature s'unissent pour nous montrer que l'homme est le résumé perfectionné de toute la série zoologique terrestre qui l'a précédé sur la scène du monde, que la forme humaine n'est pas arbitraire, et qu'elle est due, comme celle de tous les êtres vivants qui peuplent la Terre, à la combinaison des

Figure 28: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 189)

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vrage (p. 13) l'aspect de la Terre brillant dans le ciel de Mars comme une belle étoile suivant le coucher du soleil.

Les astronomes de cette planète peuvent observer la Terre parmi les constellations, comme nous observons Vénus. Ainsi, par exemple, les *Revues astronomiques* de Mars ayant à annoncer à leurs lecteurs le mouvement de la planète Terre dans le ciel pendant l'année 1884, auront publié la figure précédente (*fig.* 92), que nous avons pu du reste calculer nous-mêmes sans aller sur Mars. En ce moment, (novembre 1883), la Terre est *étoile du soir;* elle passera derrière le Soleil le 4 février, se dégagera ensuite de ses rayons, et brillera,

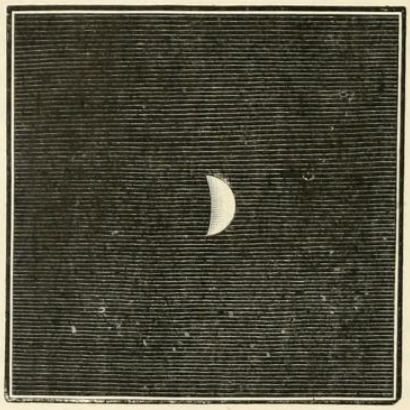

Fig. 93. — Aspect de la Terre vue de Mars (juin 1884).

étoile du matin à partir du mois de mars. Elle suivra alors devant les étoiles la route tracée sur notre petite carte, traversant successivement le Bélier, le Taureau et les Gémeaux; nous passerons le 10 avril sous les Pléiades. Notre planète arrivera le 7 mai à sa plus longue élongation occidentale (37°37'), et elle restera étoile du matin jusqu'en octobre; le 1er octobre, elle ne se lève plus que 1 heure 20 minutes avant le Soleil. Quels astronomes nous observent? Quels noms donnent-ils à notre planète, à Orion, à Sirius, qui brillent là comme ici, et parmi lesquels nous planons, astre du ciel, mystère de l'infini!

Ajoutons encore que si les habitants de Mars ont inventé des instruments d'optique, la plus petite lunette suffit pour faire recon-

Figure 29: Camille Flammarion, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884 (p. 204)

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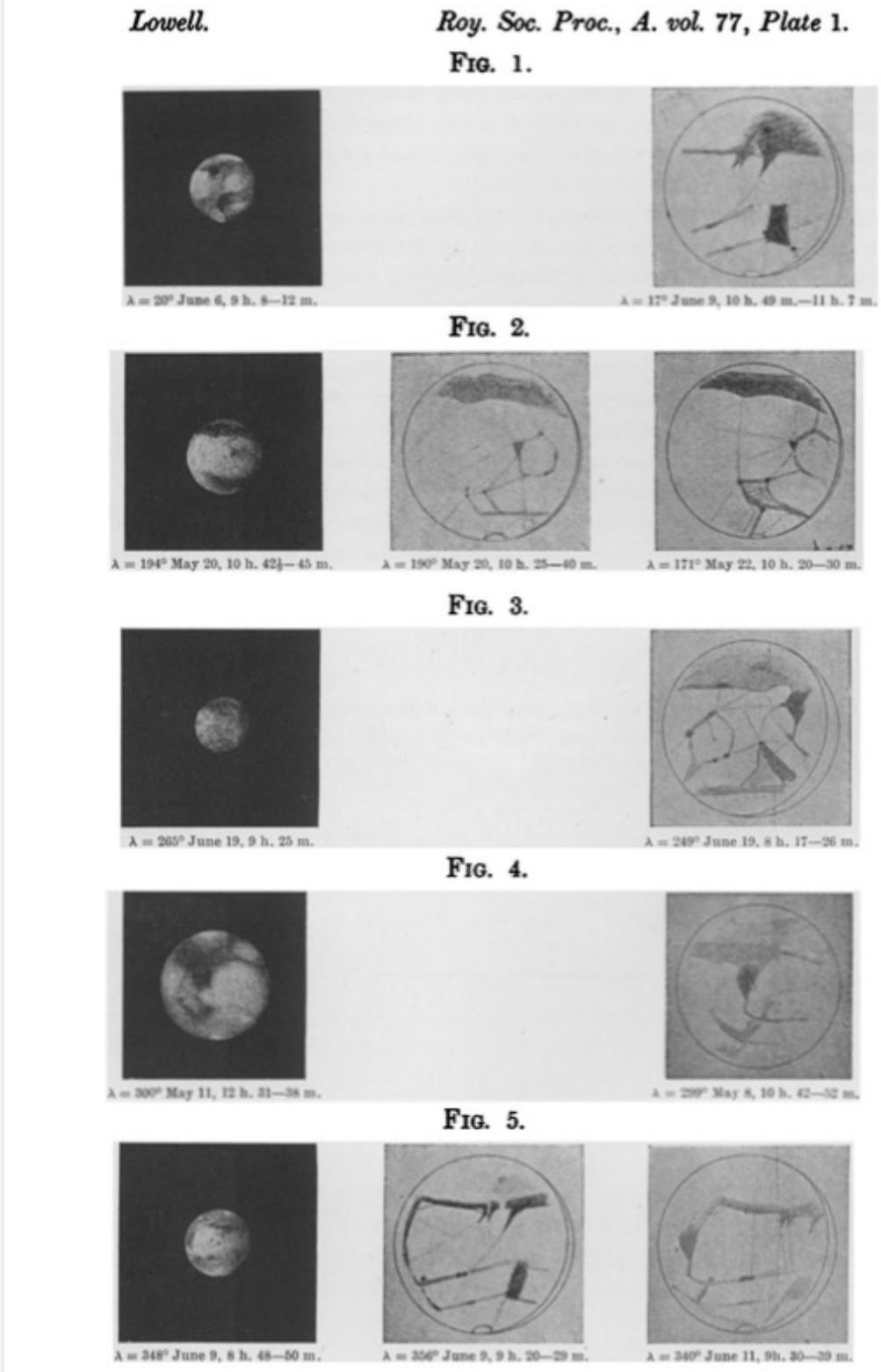

Figure 30: Percival Lowell, *First Photographs of the Canals of Mars*

In proceedings of the Royal Society of London. Series A, Containing Papers of a Mathematical and Physical Character, 1906 (p. 135)

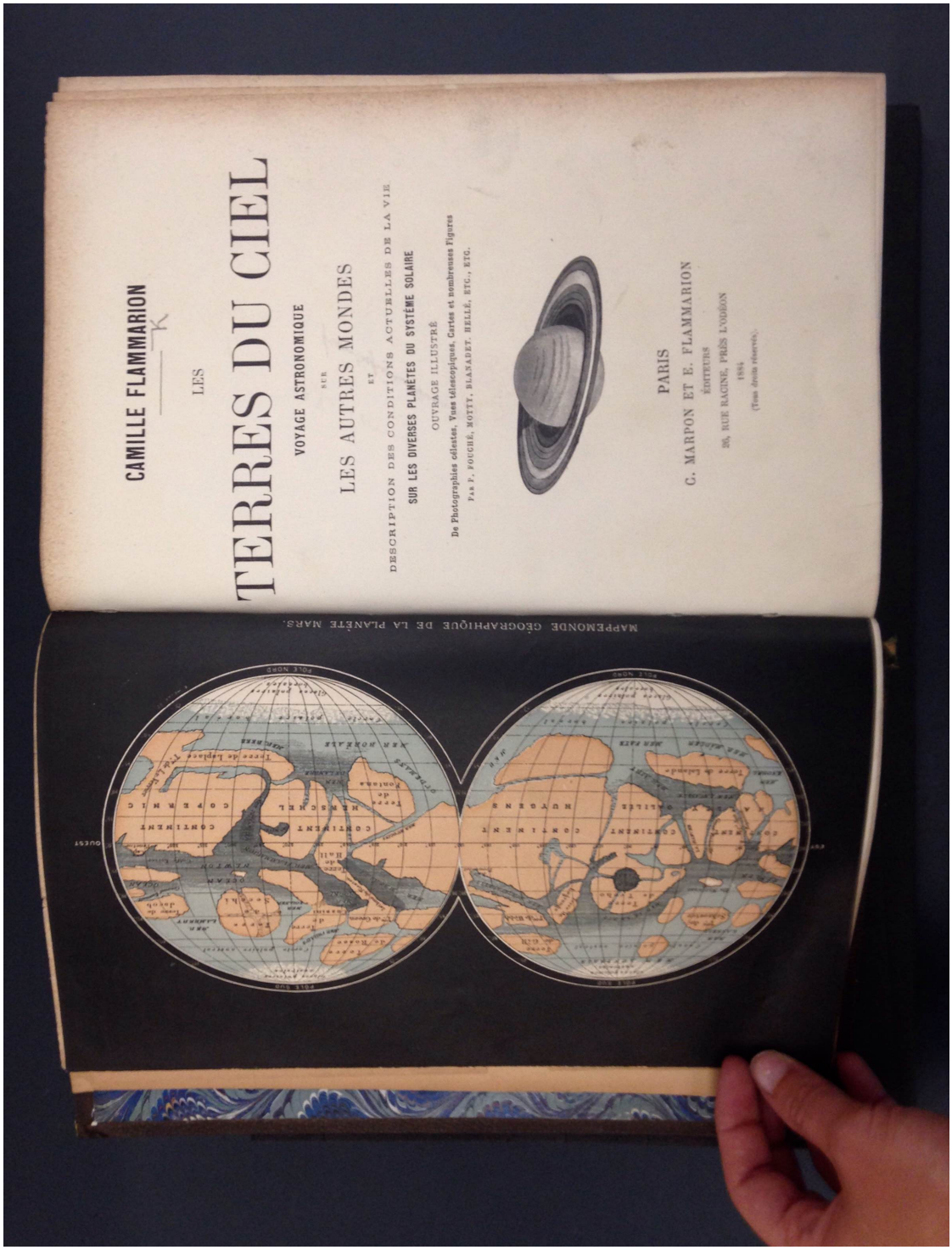

Figure 31: Camille Flammarion*, Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire,* Paris: C. Marpon et E. Flammarion, 1884

(Frontispiece and descriptive page)

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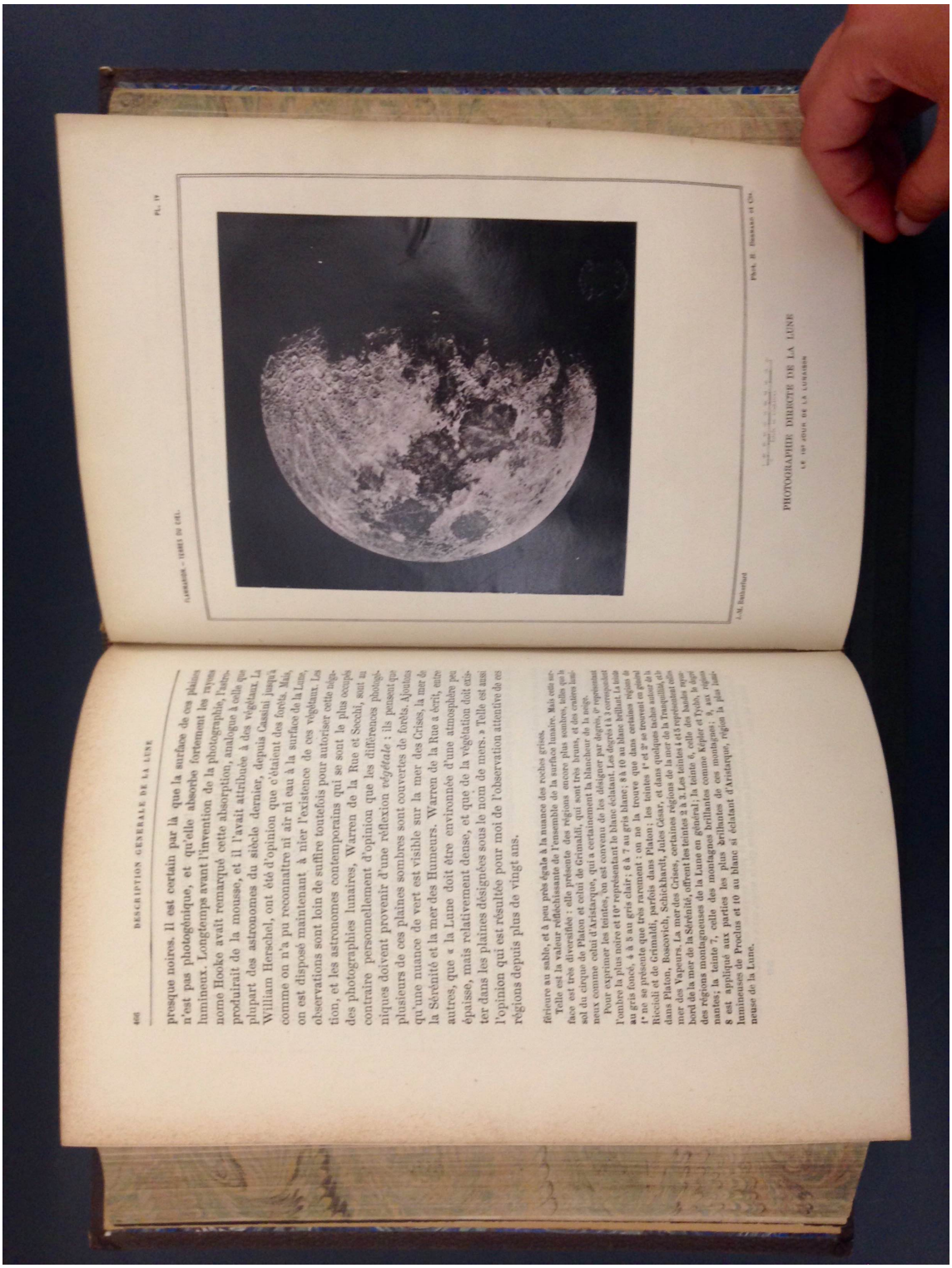

Figure 32: *Lewis Morris Rutherfurd,* Photograph of the Moon, 1865

In Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire, Paris: C. Marpon et E. Flammarion, 1884 (pp. 466-467)

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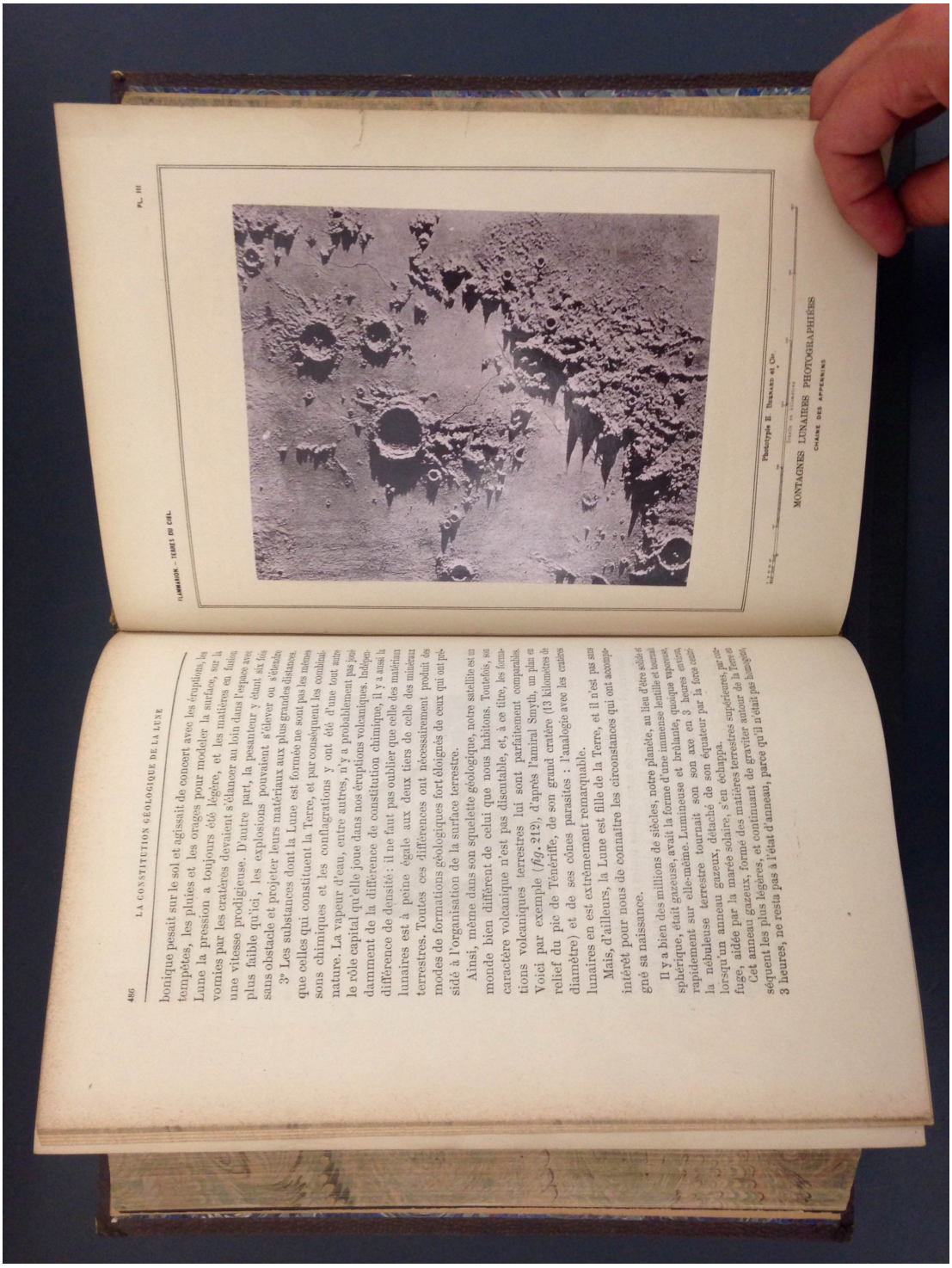

Figure 33: James Nasmyth, *Montagnes Lunaires Photographiées – Chaine des Apennins, 1874*

In Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire, Paris: C. Marpon et E. Flammarion, 1884 *(*pp. 486-487)

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Figure 34: Camille Flammarion, *Globe de la Lune,* 1896

Globe on wooden base, 14 x 27cm

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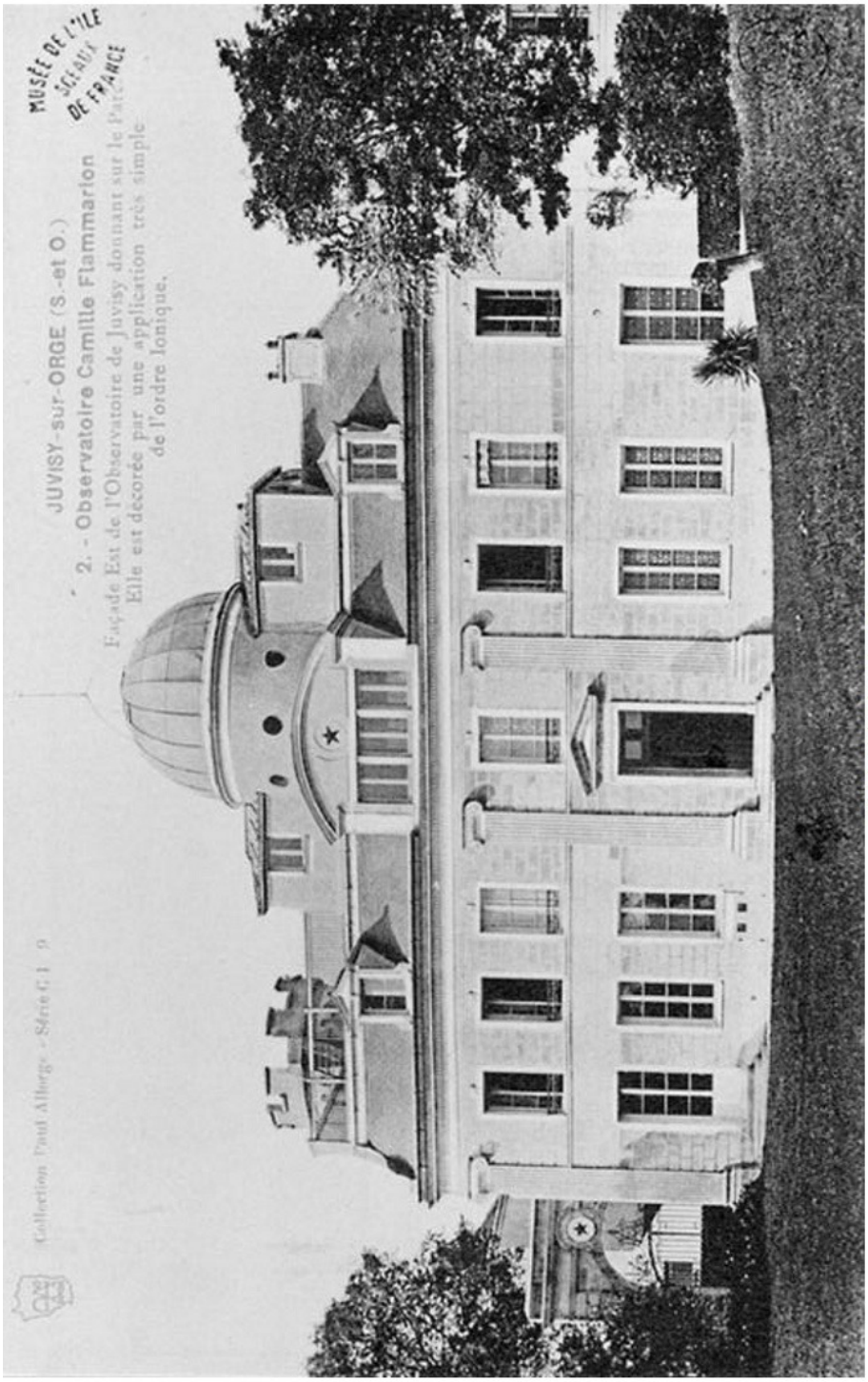

***Figure 35**: Façade sur la cour intérieure de l'observatoire Camille-Flammarion,* ca. 1900

Post-card

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M. Flammarion, par M. Antoniadi, astronome-adjoint à son Observatoire. On y a représenté tous les détails qui ont été vus et vérifiés par trois observateurs au moins.

Le globe de 1884 mesurait 0m,35 de circonférence. Celui de 1898 mesure 0m,47. Il est du même format que le globe de la Lune publié, il y a une dizaine d'années,

Fig. 266. — Nouveau globe de la planète Mars, publié par M. Flammarion en 1898.

par M. Flammarion. On aura idée de son aspect général, très documenté, par la petite photographie ci-contre (1).

Il est difficile d'identifier aucun dessin sans avoir ce globe sous les yeux.

* * *

En terminant cet exposé relatif aux études de la période 1897-1898, je dois ajouter que, sous l'obligation d'autres travaux urgents, je me suis

(1) Ce globe de Mars se trouve à la Librairie Bertaux (Thomas, successeur), rue du Sommerard, 11, à Paris.

Source gallica.bnf.fr / Bibliothèque nationale de France

Figure 36: Camille Flammarion*, La planète Mars et ses conditions d'habitabilité, synthèse générale de toutes les observations : climatologie, météorologie, aréographie, continents, mers et rivages, eaux et neiges, saisons, variations observées... par Camille Flammarion,* Paris: Gauthier-Villars, 1892-1909, vol. 2 (p. 443)

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BIBLIOGRAPHY

Primary

Flammarion, Camille, *Les Terres du ciel, description astronomique, physique, climatologique, géographique des planètes qui gravitent avec la terre autour du soleil et de l'état probable de la vie à leur surface,* Paris: Didier, 1877;

Flammarion, Camille, "À nos lecteurs", in *L'astronomie*, No. 1, Paris: Gauthier-Villars, 1882;

Flammarion, Camille, *Les terres du ciel; voyage astronomique sur les autres mondes et description des conditions actuelles de la vie sur les diverses planètes du système solaire*, Paris: C. Marpon et E. Flammarion, 1884;

Flammarion, Camille, "Un œil nouveau", in *Le Figaro. Supplément littéraire du dimanche*, Paris: Le Figaro, Year no. 15, No. 42, 19/10/1889;

Flammarion, Camille, trans. Gore, J. Ellard ["with the author's sanction"], *Popular Astronomy: A General Description of the Heavens*, London: Chatto & Windus, Picadilly, 1894;

Flammarion, Camille, trans. A.A.M. and R.M. ["authorized translation from the French"], *Lumen*, New York: Dodd, Mead and Company, 1897;

Flammarion*, Camille, "Expériences contre la réalité des canaux de Mars",* in *Bulletin de la Société Astronomique de France, L'Astronomie: revue mensuelle d'astronomie, de météorologie et de physique du globe*, Paris: Gauthier-Villars, 1905, pp. 274-283;

Flammarion, Camille, *La planète Mars et ses conditions d'habitabilité, synthèse générale de toutes les observations: climatologie, météorologie, aréographie, continents, mers et rivages, eaux et neiges, saisons, variations observées... par Camille Flammarion*, Paris: Gauthier-Villars, 1892-1909;

Lowell, Percival, "First Photographs of the Canals of Mars", in *Proceedings of the Royal Society of London. Series A, Containing Papers of a Mathematical and Physical Character*, Vol. 77, No. 515, Feb. 8, 1906, pp. 132-135;

Uzanne, Octave, "Critique Littéraire du Mois, Dernier Coup d'œil sur les livres d'étrennes pour 1884", in *Le Livre : revue mensuelle*, Paris : A. Quantin, 1884;

Secondary

Banfield, Ann, *The Phantom Table – Woolf, Fry, Russell and the Epistemology of Modernism*, Cambridge: Cambridge University Press, 2000;

Bender, John, Marrinan, Michael, *The Culture of diagram*, Stanford: Stanford University Press, 2010;

Benjamin, Walter, "The Work of Art in the Age of Mechanical Reproduction" (1936) in *Illuminations*, trans. Harry Zohn, Fontana Press, 1973, pp. 211-244;

Bergson, Henry, *Matter and memory*, London: Swan Sonnenschein, 1911;

Canadelli, Elena, "Some Curious Drawings – Mars through Giovanni Schiaparelli's eyes: between Science and Fiction", in *Nuncius*, Vol. 24, Issue 2, 2009, pp. 439-464

Chaperon, Danielle, *Camille Flammarion: entre astronomie et littérature*, Paris: Imago, 1998;

Crary, Jonathan, *Techniques of the observer: on vision and modernity in the nineteenth century*, Cambridge, Mass, London: MIT Press, 1990;

Daston, Lorraine; Galison, Peter, "The Image of Objectivity", in *Representations*, No. 40, Special Issue: Seeing Science (Autumn 1992), University of California Press, pp. 81-128;

Darwin, Charles, *On Natural Selection*, London: Penguin Books, 2004;

Darwin, Charles, *On the Origins of Species,* Oxford, New York: Oxford University Press, 1996-2008;

De Certeau, Michel, "Walking in the City", in *The Practice of Everyday Life*, Berkeley, Los Angeles, London: University of California Press, 1984;

Deleuze, Gilles, "The movement-image", *Cinema 1*, London, New York: Continuum, 2005;

Derrida, Jacques, trans. Eric Prenowitz, "Archive Fever: A Freudian Impression", in *Diacritics*, Vol. 25, No. 2, Maryland: The Johns Hopkins University Press, Summer 1995;

Derrida, Jacques, *Paper Machine*, Stanford: Stanford University Press, 2005;

Earlie, Paul, "Derrida's Archive Fever: From Debt to Inheritance", in *Paragraph*, Vol. 38, Issue 3, October 2015, pp.312-328;

Foster, Hal, "An Archival Impulse", *in October,* No. 110*,* Fall 2004*,* pp. 3–22;

Freud, Sigmund, *The Uncanny*, London: Penguim Books, 2003;

Lane, K. Maria D., *Geographies of Mars – Seeing and Knowing the Red Planet*, Chicago, London: The University of Chicago Press, 2011;

Lawlor, Leonard, *The Challenge of Bergsonism – Phenomenology, Ontology, Ethics,* London, New York: Continuum, 2003;

Lavoisy, Olivier, "Illustration and Technical Know-How in Eighteenth-Century France"*,* in *Journal of Design History*, Vol. 17, No. 2, 2004, pp. 141-162;

Manovich, Lev, *The Mapping of Space: Perspective, Radar, and 3- D Computer Graphics*, 1993. Stable URL: http://manovich.net/index.php/projects/article-1993 (08/09/2016);

Markley, Robert, *Dying Planet – Mars in Science and the Imagination*, Durham: Duke University Press, 2005;

McLuhan, Marshall, "The medium is the message", in *Understanding Media: The extension of Man*, 1964, Stable URL: http://web.mit.edu/allanmc/www/mcluhan.mediummessage.pdf (22/04/2016);

McNamara, Patrick, "Bergson's 'Metter and Memory' and Modern Selectionist Theories of Memory", in *Brain and Cognition*, No. 30, 1996, pp. 215-231;

Miah, Sajahan, *Russell's Theory of Perception, 1905-1919,* London, New York: Continuum, 2006;

Mitchell, W.J.T., "Word and Image", in *Critical Terms for Art History*, edited by Robert S. Nelson and Richard Shiff, Chicago: University of Chicago Press, 1996, pp. 47–57;

Mitchell, W.J.T., "What Do Pictures "Really 'Want?'" in *October,* No. 77, Summer 1996, pp. 71-82;

Nead, Lynda, "Lumen and the Celestial Archive of Images", in *The Haunted Gallery, Painting, Photography, Film c. 1900*, New Haven, London: Yale University Press, 2007;

Pierre, Arnauld, *Maternités Cosmiques, La Recherche des origines, de Kupka à Kubrick*, Paris: Éditions Hazan, 2010;

Russell, Bertrand, *Our knowledge of the external world as a field for scientific method in philosophy*, London: Allen & Unwin, 1926;

Russell, Bertrand, *The Relation of Sense-data to Physics in his Mysticism and Logic*, London: George Allen & Unwin Ltd.: 1917, Reprinted Totowa, New Jersey: Barnes & Noble Books, 1951, pp. 108-13;

Samuels, Maurice, *The spectacular past: popular history and the novel in nineteenth-century France*, Ithaca: Cornell University Press, 2004;

Schwartz, Vanessa R., *Spectacular Realities: Early Mass Culture in Fin-de-Siècle Paris*, Berkeley, Los Angeles, London: University of California Press, 1998;

Taws, Richard, *When I was a Telegrapher*, 14th December 2014, Stable URL: http://nonsite.org/article/when-i-was-a-telegrapher (09/08/2016);

Tresch, John, "The Prophet and the Pendulum: Sensational Science and Audiovisual Phantasmagoria around 1848", in *Grey Room*, No. 43, Spring 2011, pp. 16-41;